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(54) **METHODS AND SYSTEMS FOR GENERATION AND RENDERING INTERACTIVE EVENTS HAVING COMBINED ACTIVITY AND LOCATION INFORMATION**

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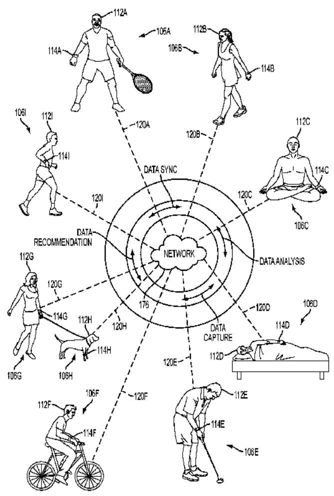
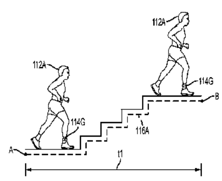
(57) **ABSTRACT**

A computer-implemented method is described. The computer-implemented method is used for populating data of a graphical user interface (GUI). The computer-implemented method includes generating one or more graphical elements of one or more activities captured by a monitoring device. The monitoring device is usable by a user during the capturing. The method further includes generating a timeline including a time period over which the activities are performed. The timeline includes a chronological order of time within the time period. The method further includes generating an activity symbol for one or more of the activities performed during the time period. The activity symbol has an image that is graphically overlaid on the graphical elements of the activities.

20 Claims, 40 Drawing Sheets





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continuation of application No. 13/959,717, filed on Aug. 5, 2013, now Pat. No. 8,762,102, and a continuation-in-part of application No. 13/693,334, filed on Dec. 4, 2012, now Pat. No. 8,548,770, which is a division of application No. 13/667,229, filed on Nov. 2, 2012, now Pat. No. 8,437,980, which is a division of application No. 13/469,027, filed on May 10, 2012, now Pat. No. 8,311,769, which is a division of application No. 13/246,843, filed on Sep. 27, 2011, now Pat. No. 8,180,591, which is a division of application No. 13/156,304, filed on Jun. 8, 2011, said application No. 13/959,717 is a continuation-in-part of application No. 13/759,485, filed on Feb. 5, 2013, now Pat. No. 8,543,351.

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(58) **Field of Classification Search**
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See application file for complete search history.

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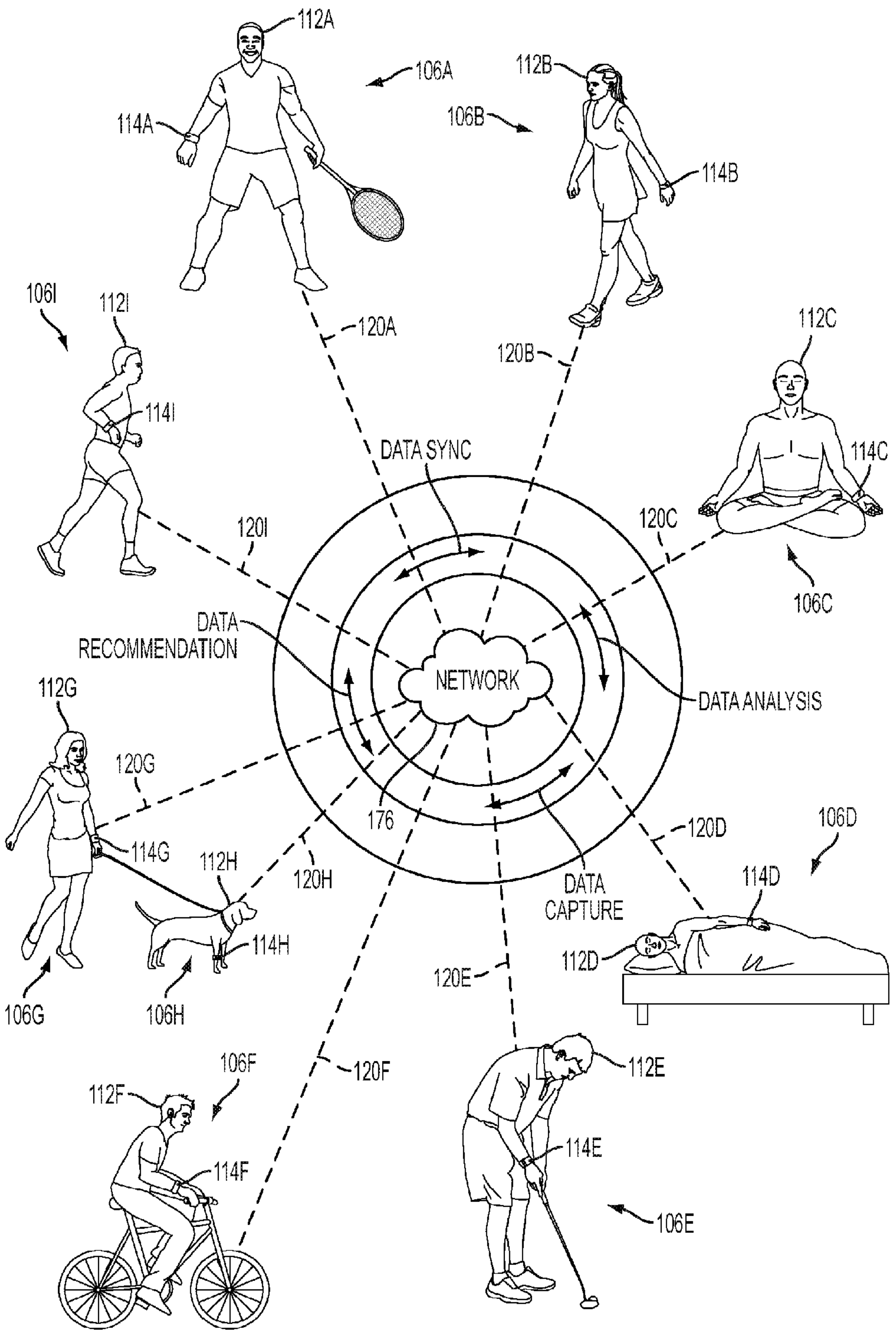

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120C
106C
DATA
RECOMMENDATION
NETWORK
DATA ANALYSIS
112G
120G
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120D
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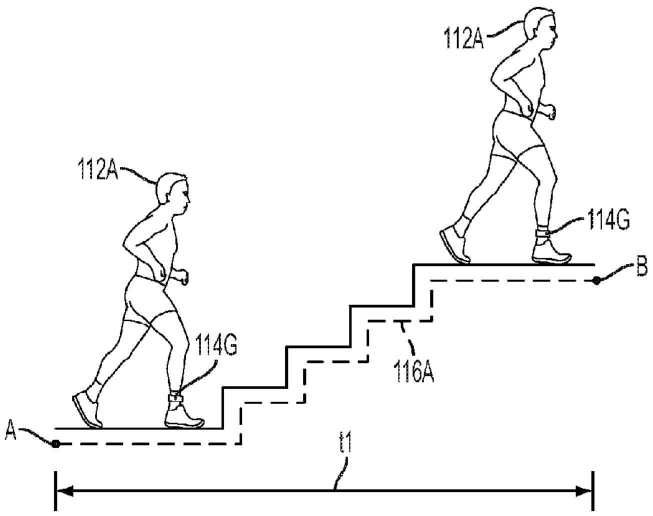
FIG. 1A



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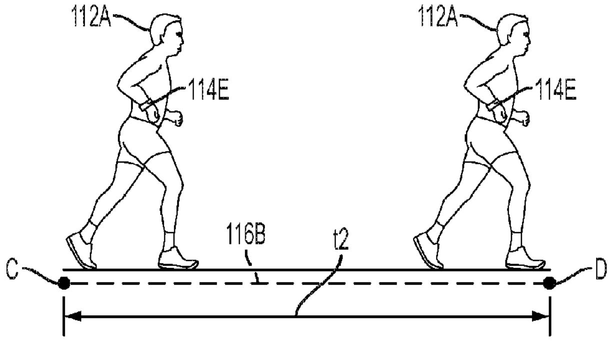

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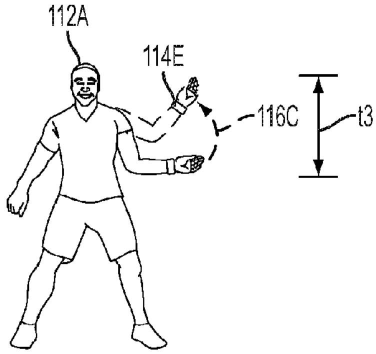

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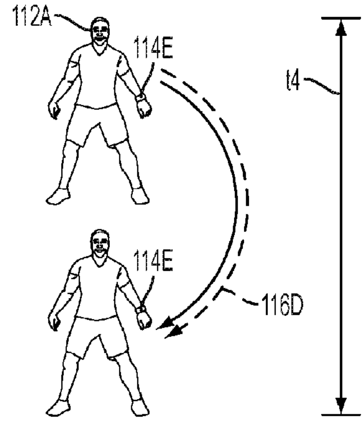

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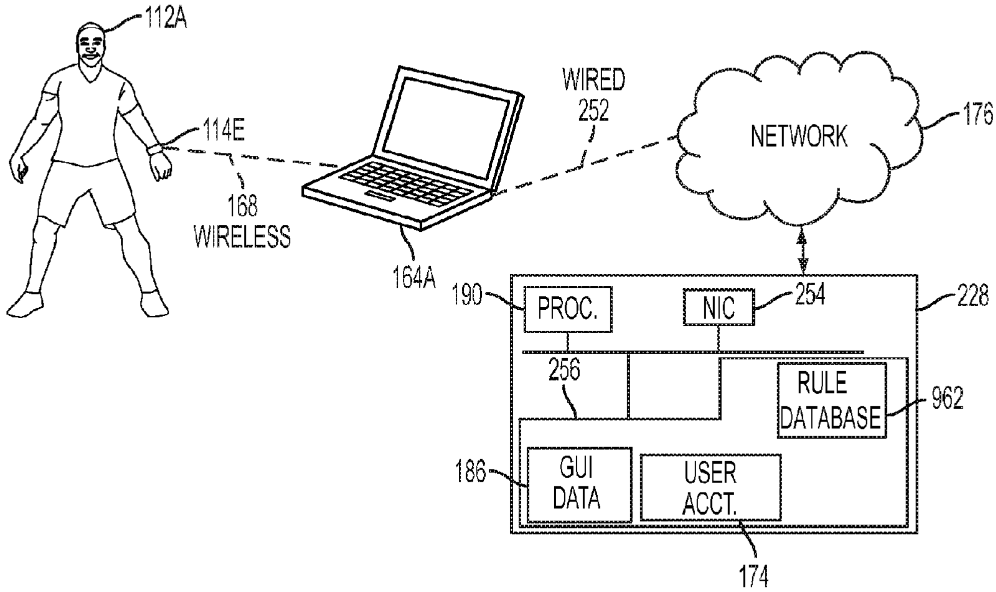
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DATABASE
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186
GUI
DATA
USER
ACCT.
174

FIG. 2A

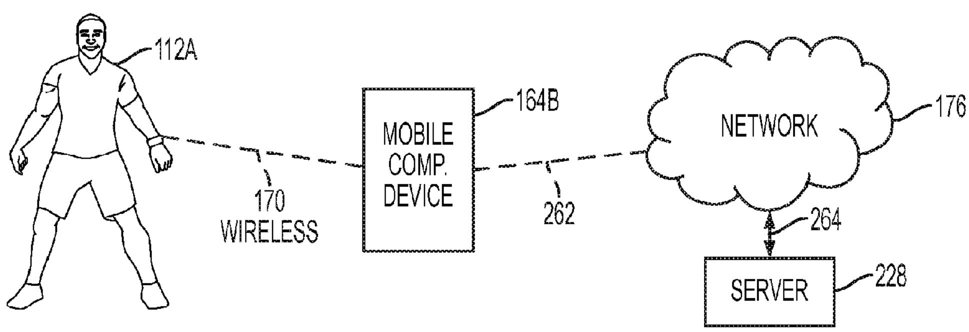
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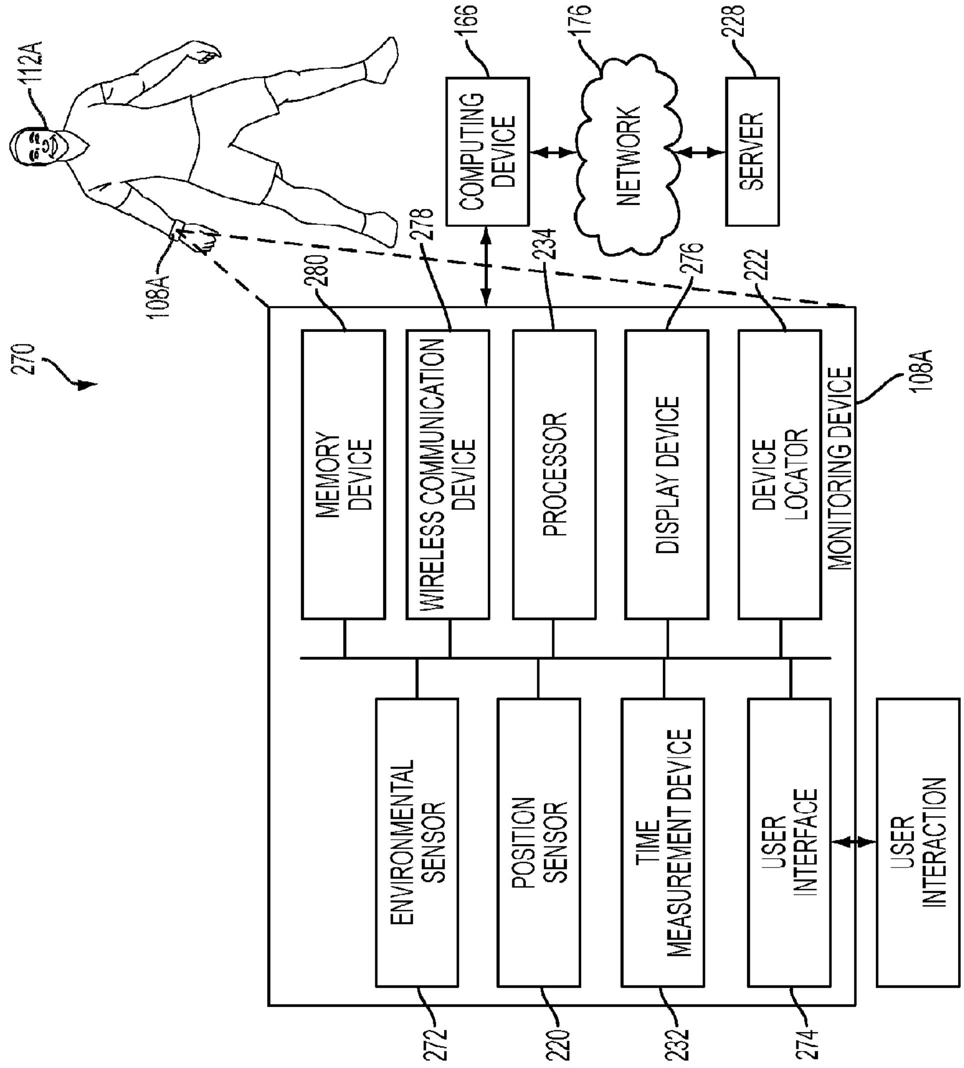
FIG. 2B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MEMORY DEVICE
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WIRELESS COMMUNICATION DEVICE
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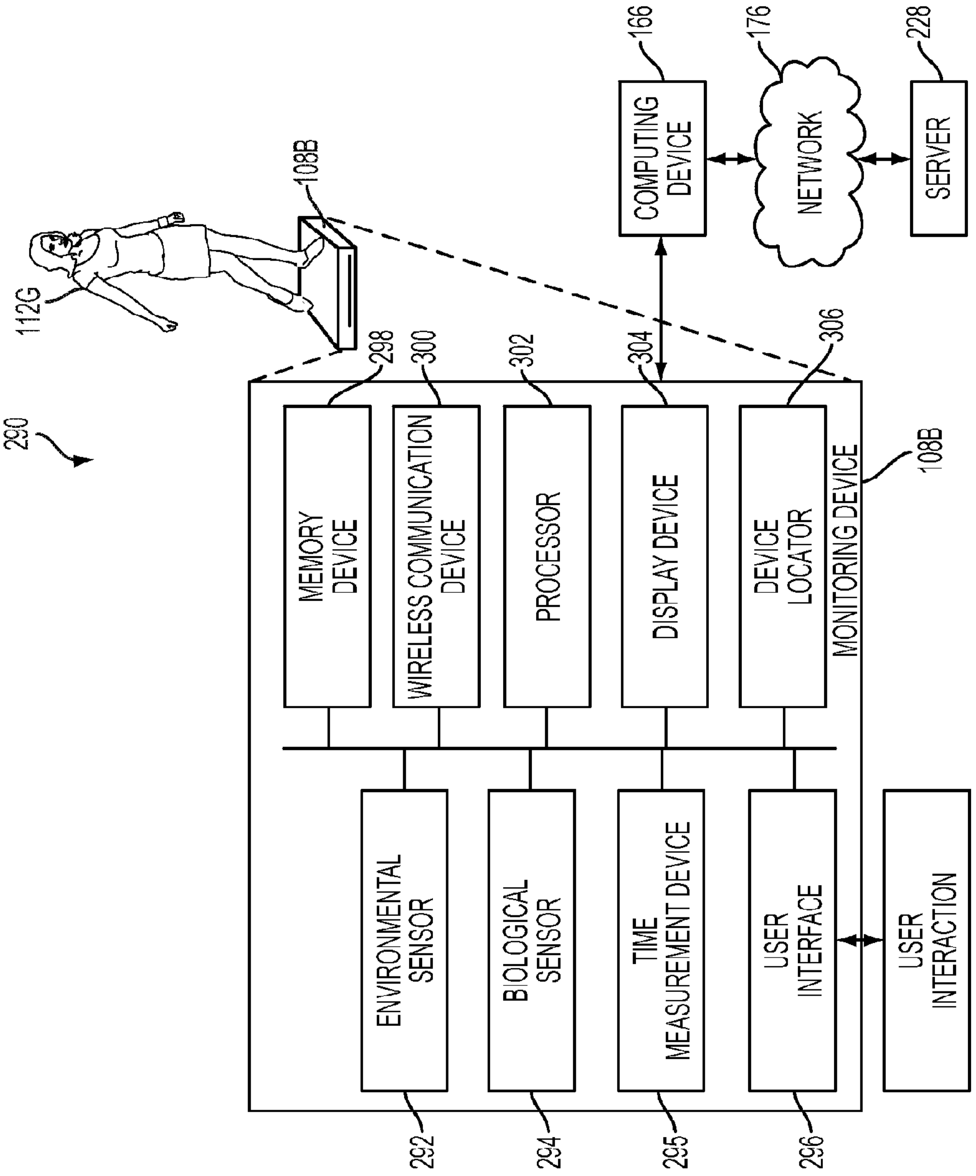
PROCESSOR
276
DISPLAY DEVICE
222
DEVICE LOCATOR
MONITORING DEVICE
108A
ENVIRONMENTAL SENSOR
272
POSITION SENSOR
220
TIME MEASUREMENT DEVICE
232
USER INTERFACE
274
USER INTERACTION

FIG. 3A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PROCESSOR
304
DISPLAY DEVICE
306
DEVICE LOCATOR
MONITORING DEVICE
108B
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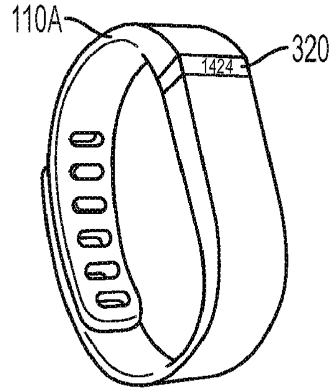
292
BIOLOGICAL SENSOR
294
TIME MEASUREMENT DEVICE
295
USER INTERFACE
296
USER INTERACTION

FIG. 3B



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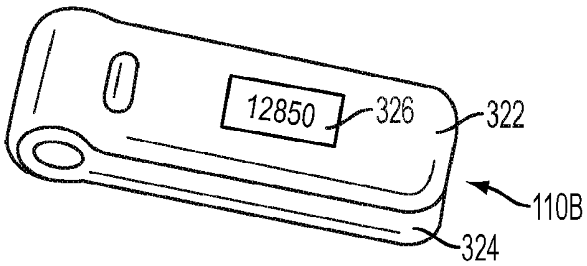

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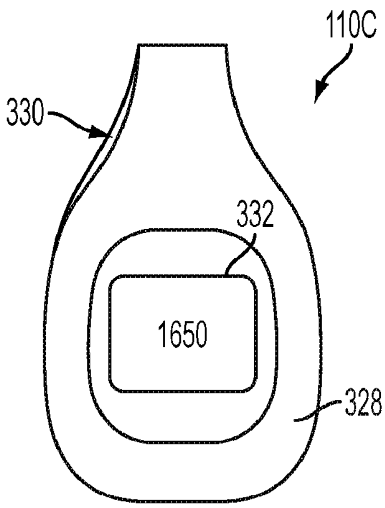

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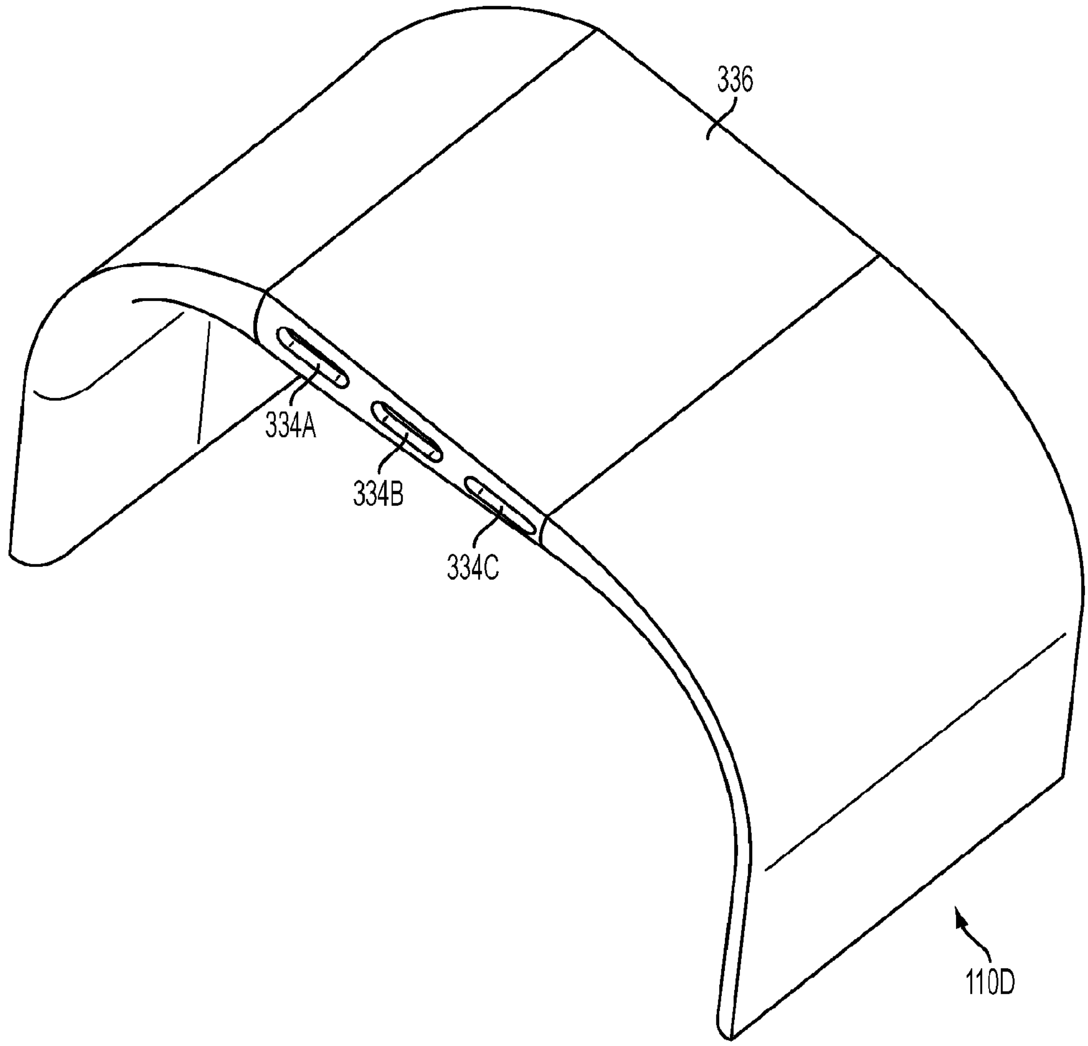

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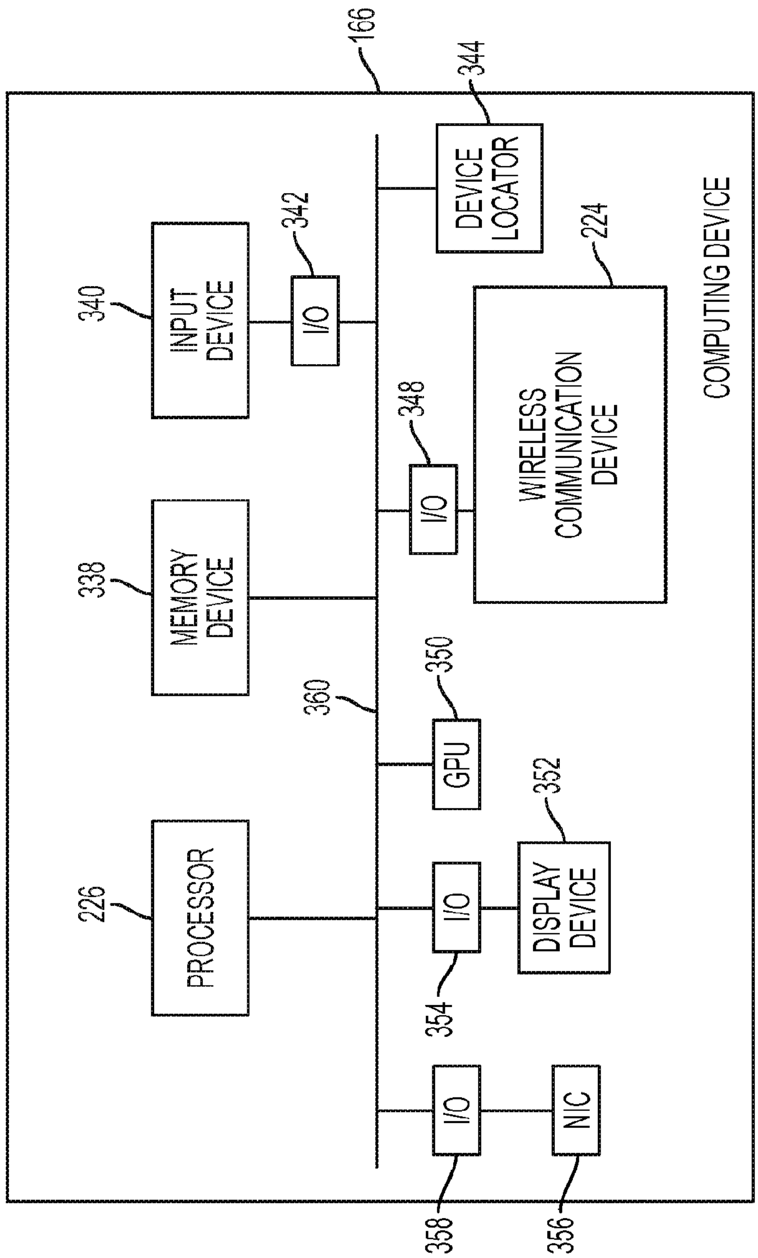
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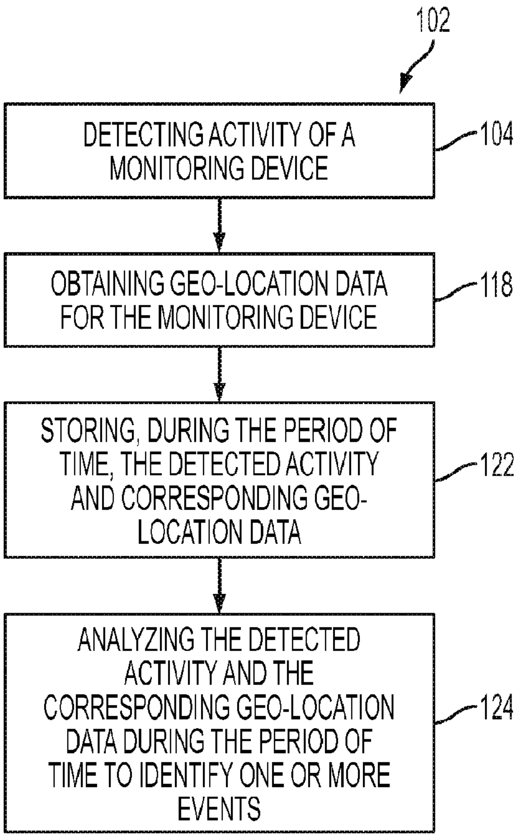
358
356

FIG. 5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DETECTING ACTIVITY OF A MONITORING DEVICE
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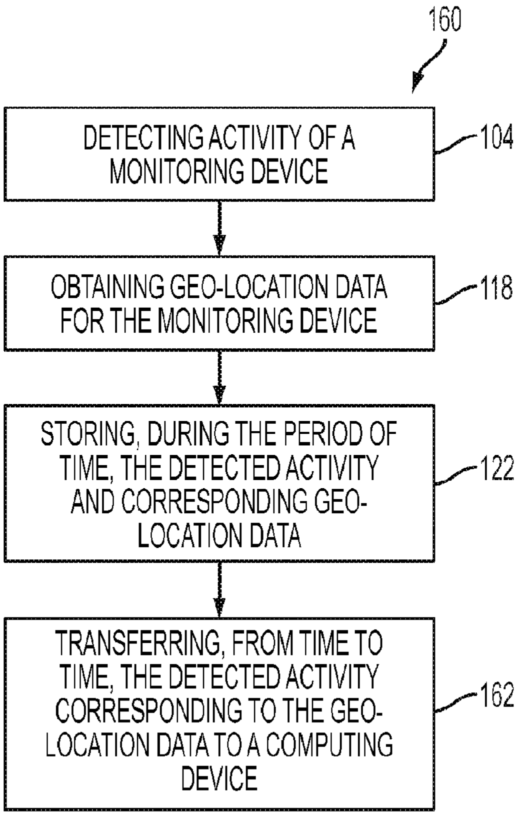
OBTAINING GEO-LOCATION DATA FOR THE MONITORING DEVICE
118
STORING, DURING THE PERIOD OF TIME, THE DETECTED ACTIVITY AND CORRESPONDING GEO-LOCATION DATA
122
ANALYZING THE DETECTED ACTIVITY AND THE CORRESPONDING GEO-LOCATION DATA DURING THE PERIOD OF TIME TO IDENTIFY ONE OR MORE EVENTS
124

FIG. 6A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DETECTING ACTIVITY OF A MONITORING DEVICE
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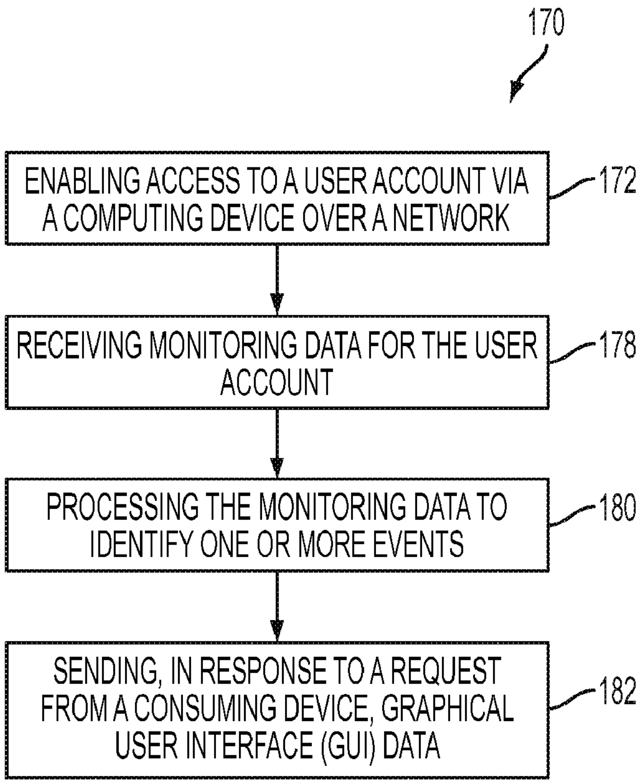
OBTAINING GEO-LOCATION DATA FOR THE MONITORING DEVICE
118
STORING, DURING THE PERIOD OF TIME, THE DETECTED ACTIVITY AND CORRESPONDING GEO-LOCATION DATA
122
TRANSFERRING, FROM TIME TO TIME, THE DETECTED ACTIVITY CORRESPONDING TO THE GEO-LOCATION DATA TO A COMPUTING DEVICE
162

FIG. 6B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ENABLING ACCESS TO A USER ACCOUNT VIA A COMPUTING DEVICE OVER A NETWORK
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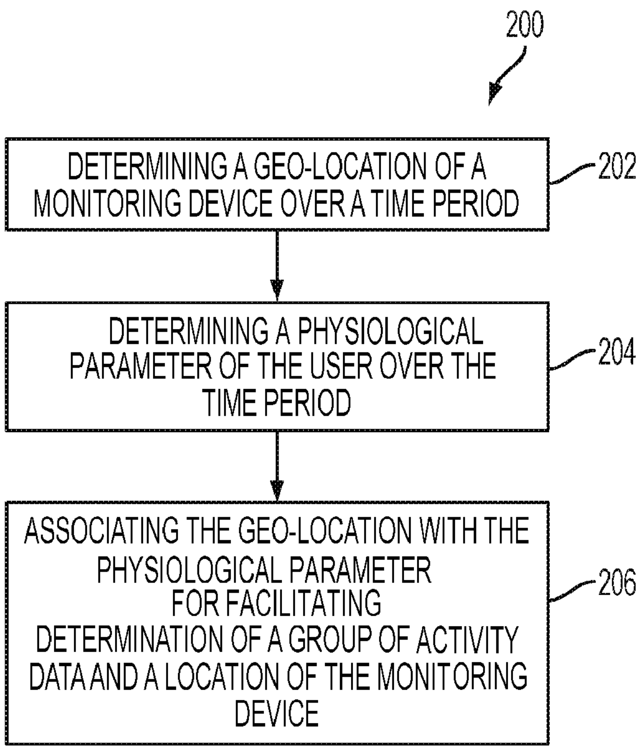
RECEIVING MONITORING DATA FOR THE USER ACCOUNT
178
PROCESSING THE MONITORING DATA TO IDENTIFY ONE OR MORE EVENTS
180
SENDING, IN RESPONSE TO A REQUEST FROM A CONSUMING DEVICE, GRAPHICAL USER INTERFACE (GUI) DATA
182

FIG. 6C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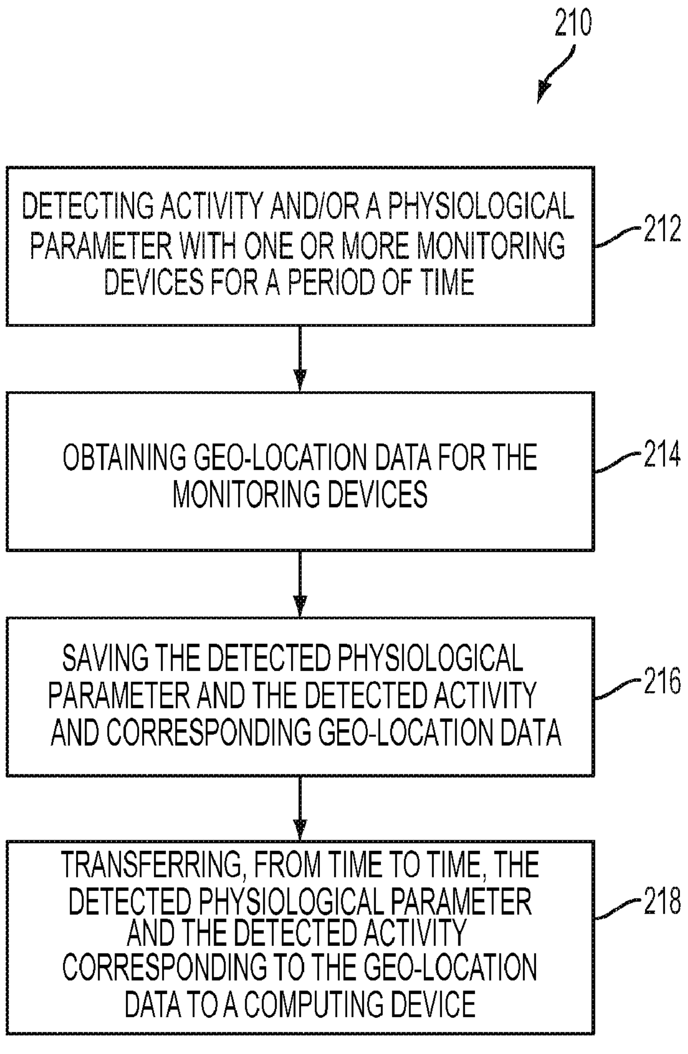
DETERMINING A GEO-LOCATION OF A MONITORING DEVICE OVER A TIME PERIOD
202
DETERMINING A PHYSIOLOGICAL PARAMETER OF THE USER OVER THE TIME PERIOD
204
ASSOCIATING THE GEO-LOCATION WITH THE PHYSIOLOGICAL PARAMETER FOR FACILITATING DETERMINATION OF A GROUP OF ACTIVITY DATA AND A LOCATION OF THE MONITORING DEVICE
206

FIG. 6D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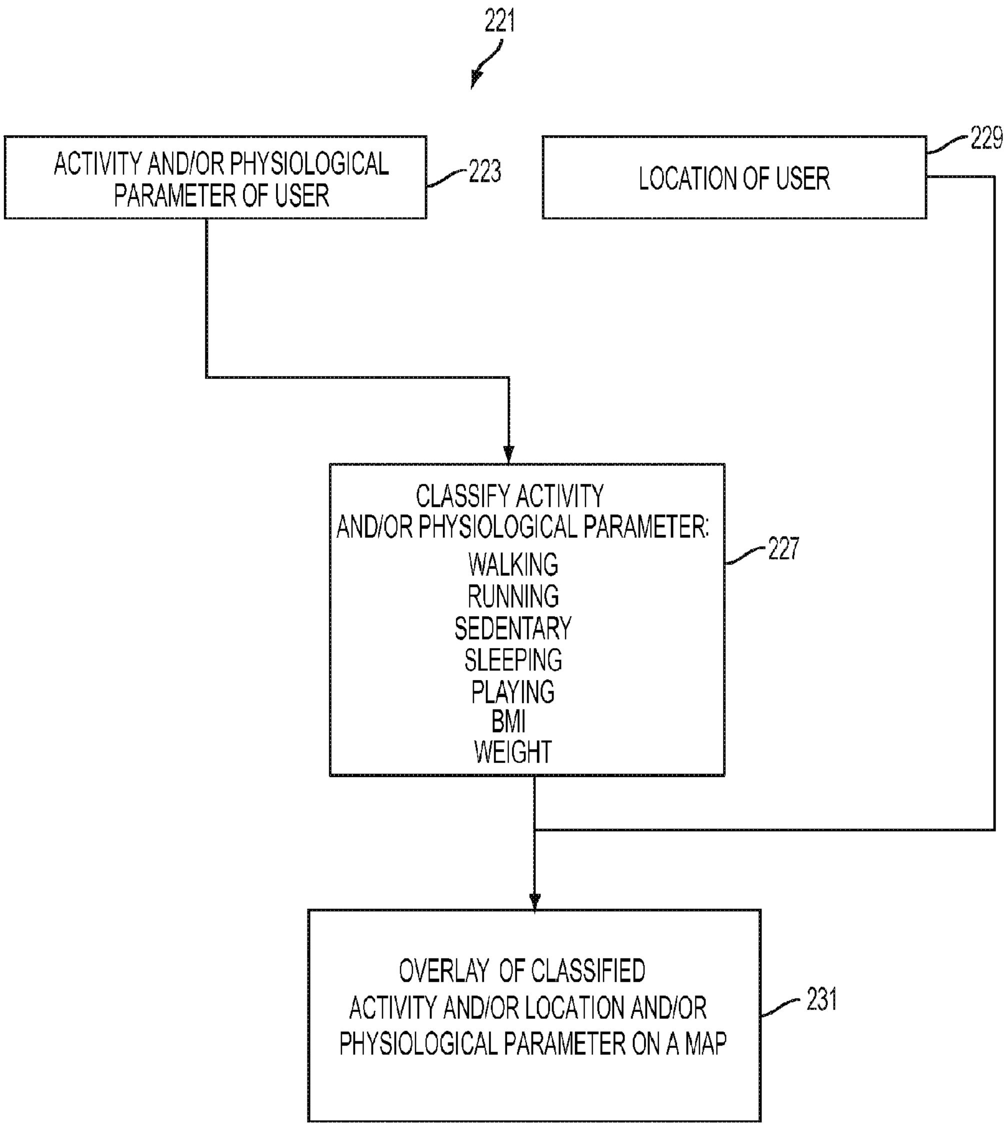
DETECTING ACTIVITY AND/OR A PHYSIOLOGICAL PARAMETER WITH ONE OR MORE MONITORING DEVICES FOR A PERIOD OF TIME
212
OBTAINING GEO-LOCATION DATA FOR THE MONITORING DEVICES
214
SAVING THE DETECTED PHYSIOLOGICAL PARAMETER AND THE DETECTED ACTIVITY AND CORRESPONDING GEO-LOCATION DATA
216
TRANSFERRING, FROM TIME TO TIME, THE DETECTED PHYSIOLOGICAL PARAMETER AND THE DETECTED ACTIVITY CORRESPONDING TO THE GEO-LOCATION DATA TO A COMPUTING DEVICE
218

FIG. 6E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ACTIVITY AND/OR PHYSIOLOGICAL PARAMETER OF USER
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LOCATION OF USER
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RUNNING
SEDENTARY
SLEEPING
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WEIGHT
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OVERLAY OF CLASSIFIED ACTIVITY AND/OR LOCATION AND/OR PHYSIOLOGICAL PARAMETER ON A MAP
231

FIG. 6F

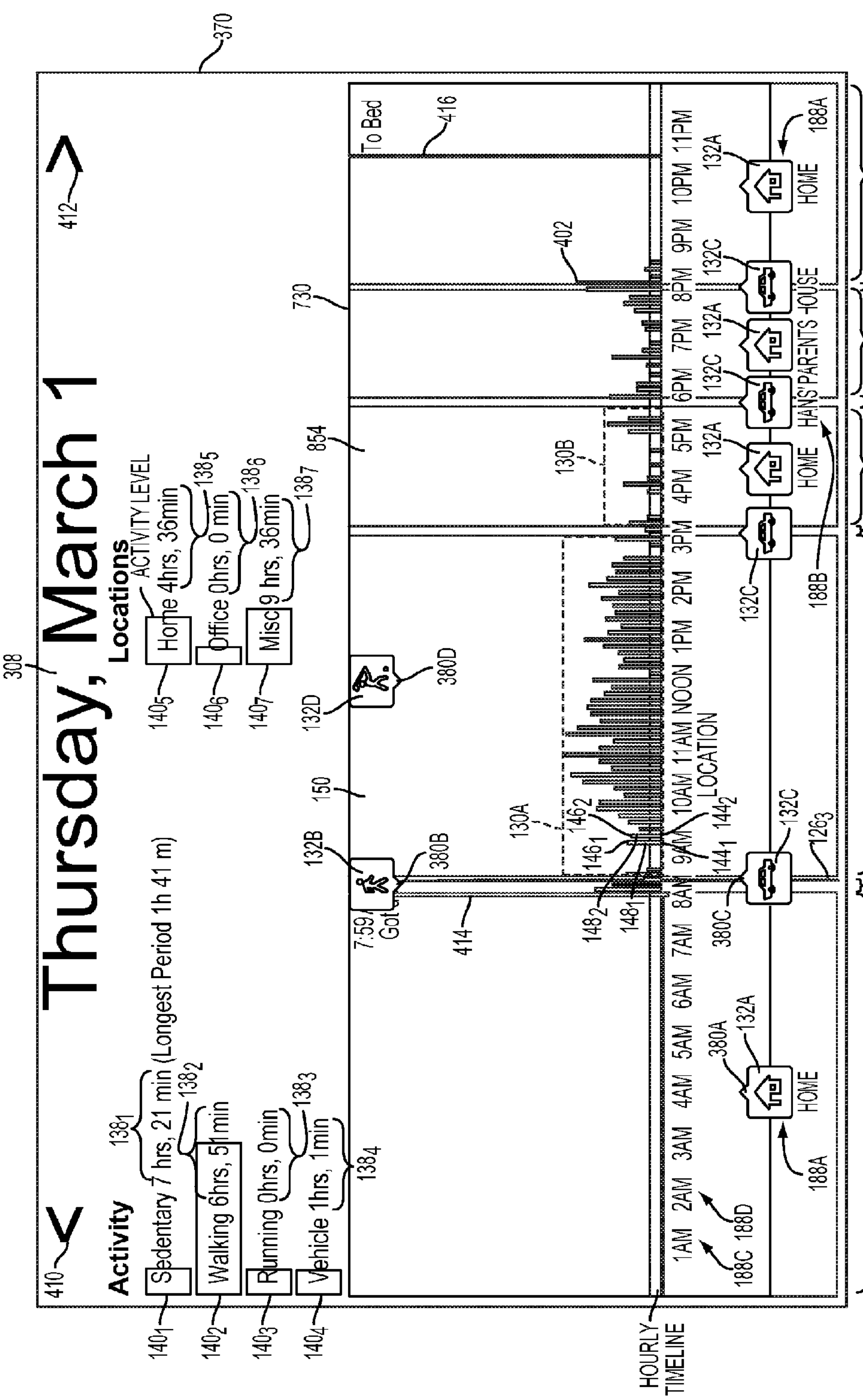

Thursday, March 1
Activity
Sedentary 7 hrs, 21 min (Longest Period 1h 41 m)
Walking 6hrs, 51 min
Running 0hrs, 0min
Vehicle 1hrs, 1min
Locations
ACTIVITY LEVEL
Home 4hrs, 36min
Office 0hrs, 0 min
Misc 9 hrs, 36min
7:59 Got
To Bed
LOCATION
1AM 2AM 3AM 4AM 5AM 6AM 7AM 8AM 9AM 10AM 11AM NOON 1PM 2PM 3PM 4PM 5PM 6PM 7PM 8PM 9PM 10PM 11PM
HOME
HANS' PARENTS HOUSE
HOURLY TIMELINE

FIG. 7A

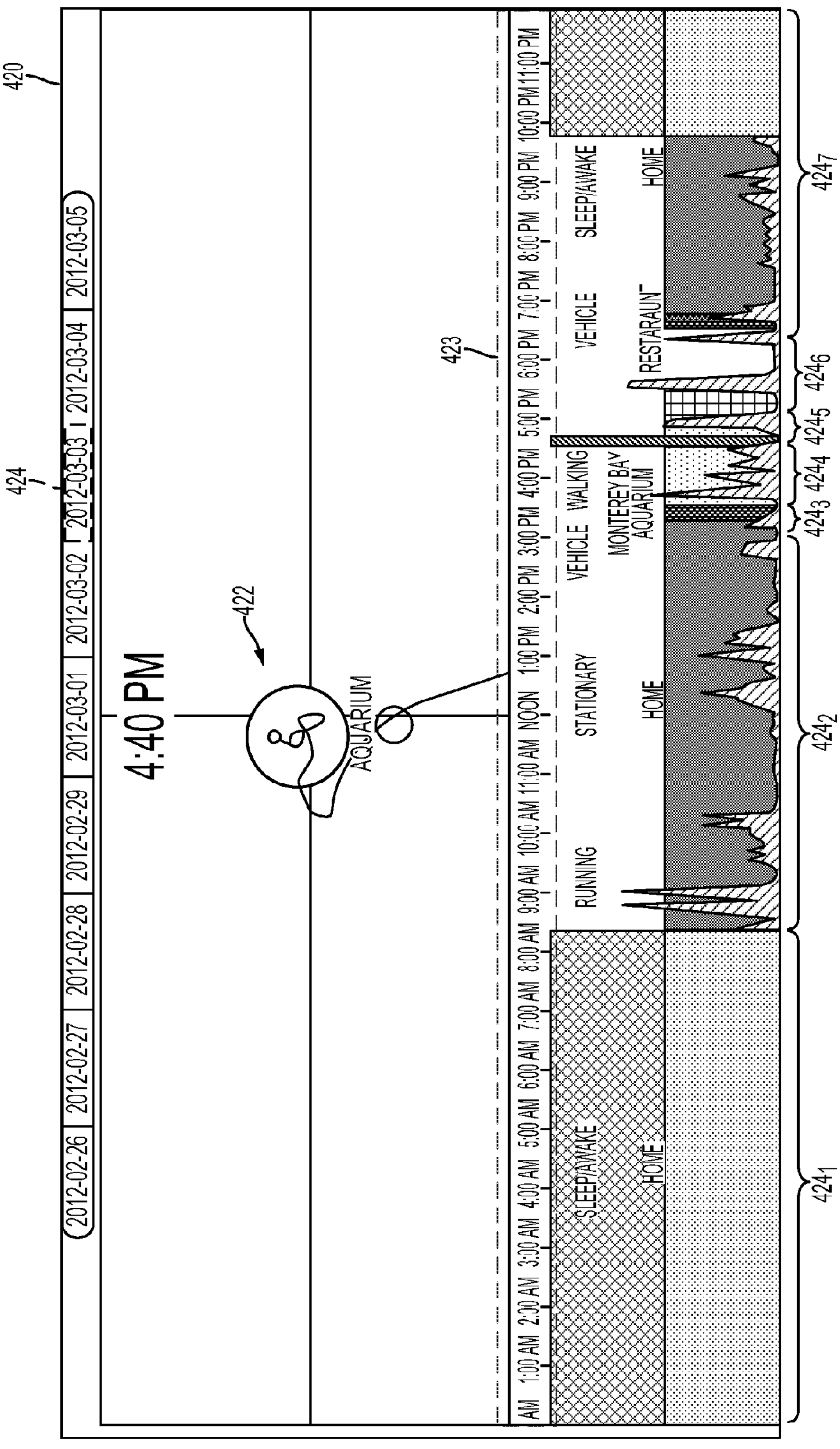

420
424
2012-02-26
2012-02-27
2012-02-28
2012-02-29
2012-03-01
2012-03-02
2012-03-03
2012-03-04
2012-03-05
4:40 PM
422
AQUARIUM
423
AM 1:00 AM 2:00 AM 3:00 AM 4:00 AM 5:00 AM 6:00 AM 7:00 AM 8:00 AM 9:00 AM 10:00 AM 11:00 AM NOON 1:00 PM 2:00 PM 3:00 PM 4:00 PM 5:00 PM 6:00 PM 7:00 PM 8:00 PM 9:00 PM 10:00 PM 11:00 PM
SLEEP/AWAKE
HOME
RUNNING
STATIONARY
HOME
VEHICLE
WALKING
MONTEREY BAY AQUARIUM
RESTARAUNT
VEHICLE
SLEEP/AWAKE
HOME
424₁
424₂
424₃
424₄
424₅
424₆
424₇

FIG. 7B

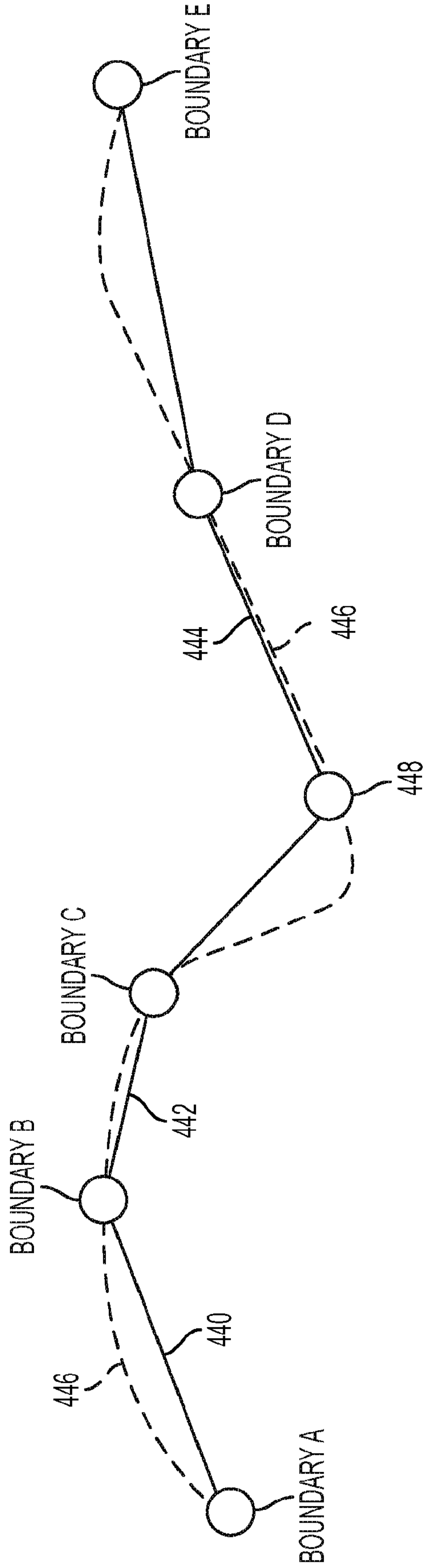

BOUNDARY E
BOUNDARY D
444
446
448
BOUNDARY C
442
BOUNDARY B
440
446
BOUNDARY A

FIG. 7C

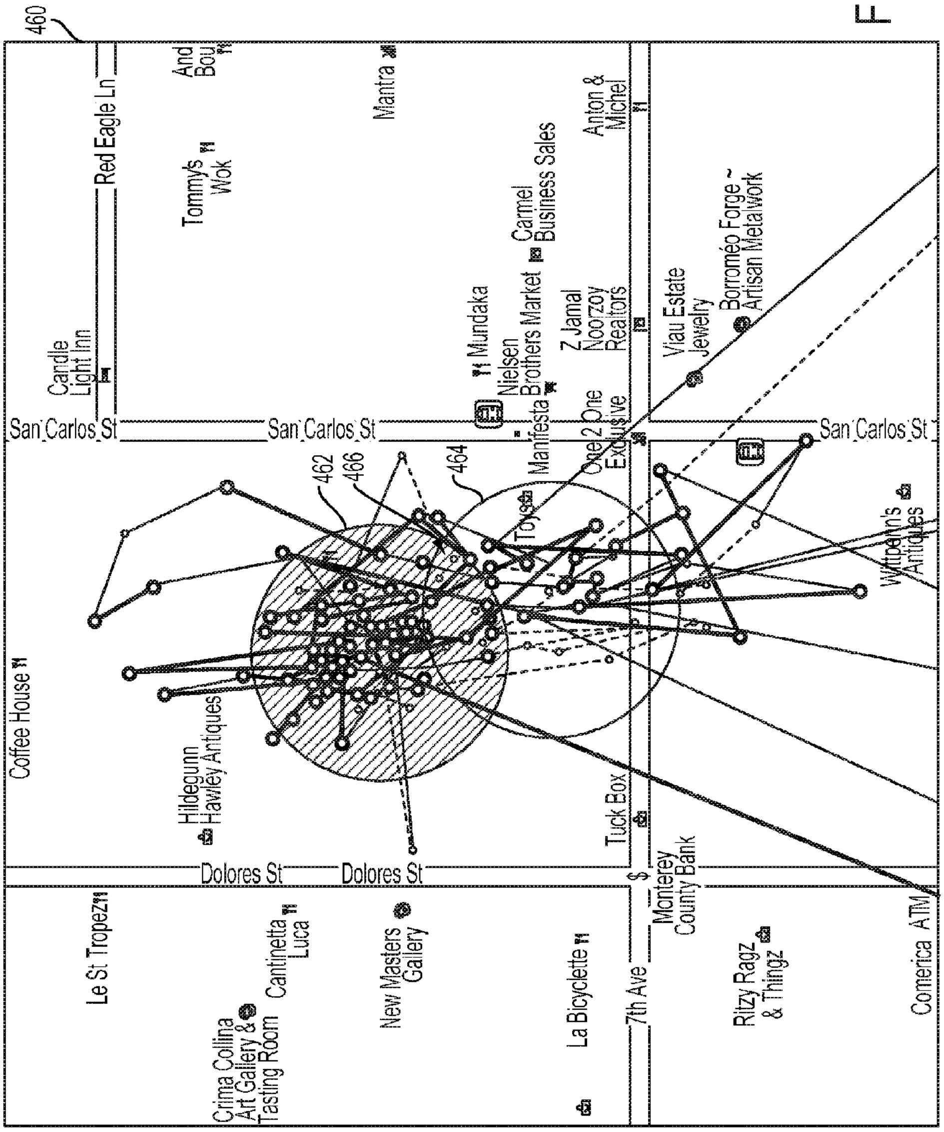

460
462
466
464
Red Eagle Ln
Candle Light Inn
Tommy's Wok
And Bou
Mantra
Anton & Michel
Carmel Business Sales
Mundaka
Nielsen Brothers Market
Manifesta
Z Jamal Noorzoy Realtors
One 2 One Exclusive
Viau Estate Jewelry
Borromeo Forge ~ Artisan Metalwork
San Carlos St
San Carlos St
San Carlos St
Coffee House
Hildegunn Hawley Antiques
Toys
Wittpenn's Antiques
Tuck Box
Dolores St
Dolores St
Le St Tropez
Cantinetta Luca
Crima Collina Art Gallery & Tasting Room
New Masters Gallery
La Bicyclette
7th Ave
Monterey County Bank
Ritzy Ragz & Thingz
Comerica ATM

FIG. 7D

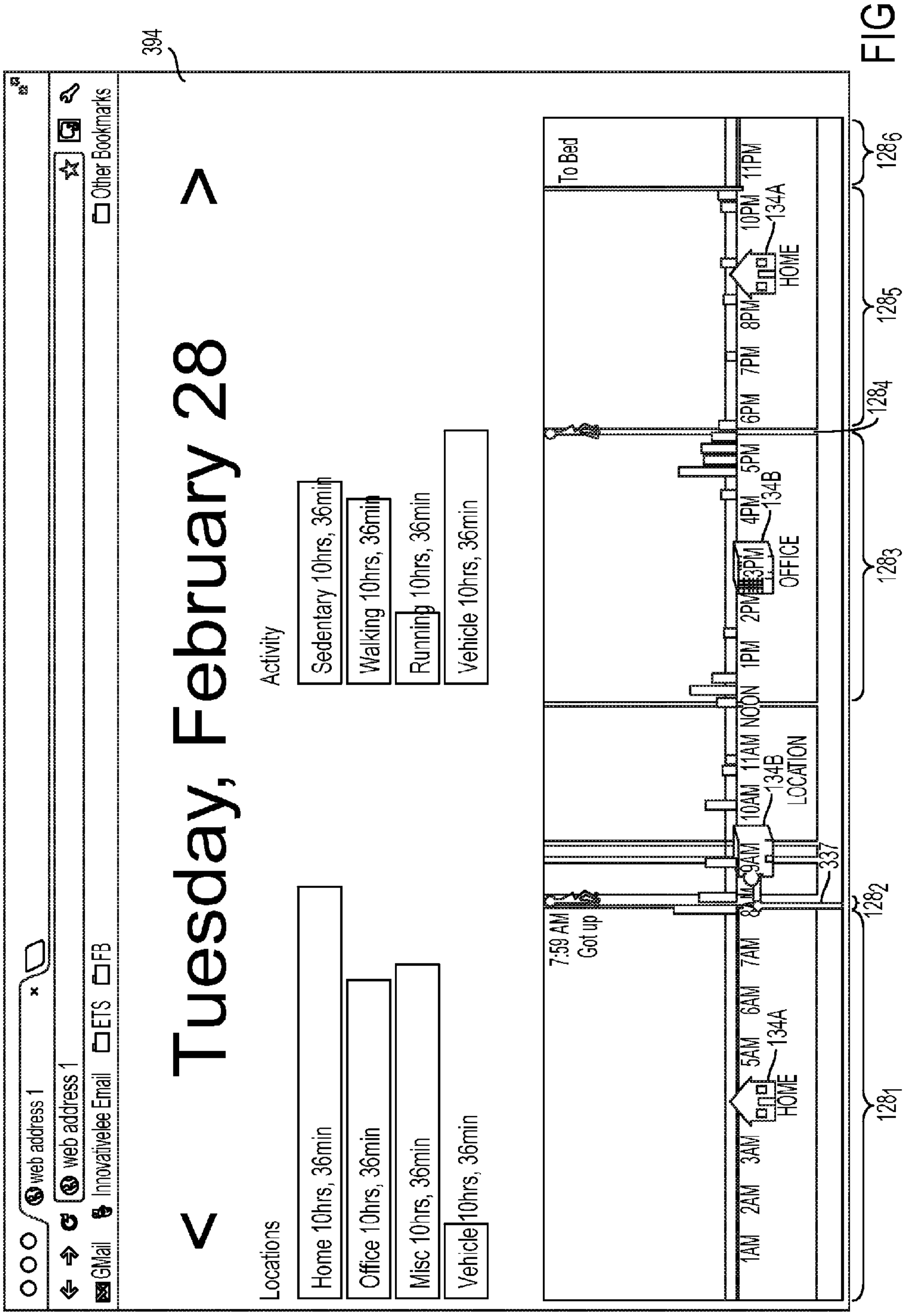
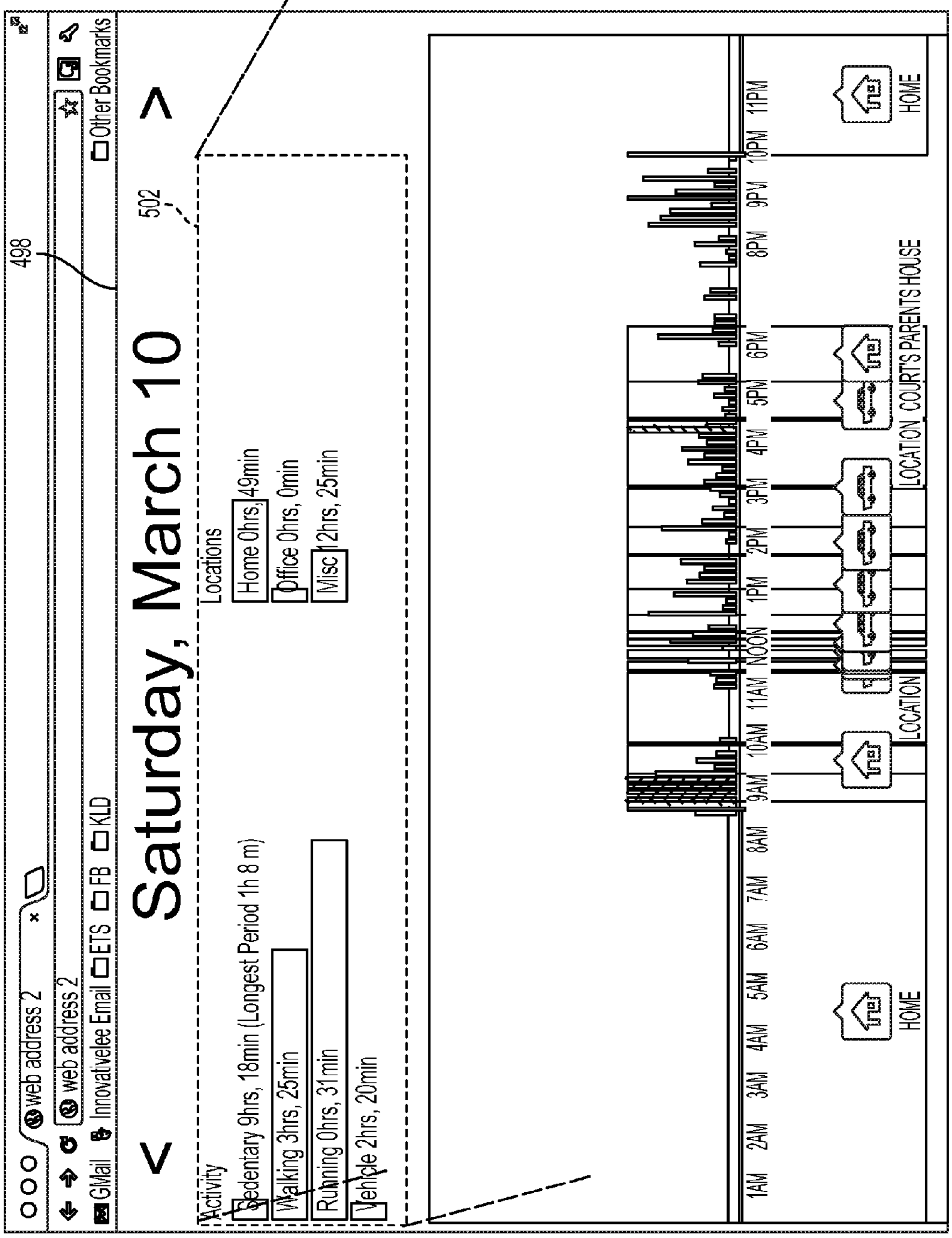

web address 1
web address 1
GMail
Innovativelee Email
ETS
FB
Other Bookmarks
394
Tuesday, February 28
Locations
Home 10hrs, 36min
Office 10hrs, 36min
Misc 10hrs, 36min
Vehicle 10hrs, 36min
Activity
Sedentary 10hrs, 36min
Walking 10hrs, 36min
Running 10hrs, 36min
Vehicle 10hrs, 36min
7:59 AM
Got up
To Bed
1AM 2AM 3AM 5AM 6AM 7AM 8AM 9AM 10AM 11AM NOON 1PM 2PM 3PM 4PM 5PM 6PM 7PM 8PM 10PM 11PM
HOME
134A
134B
LOCATION
OFFICE
337
128_1
128_2
128_3
128_4
128_5
128_6

FIG. 7E



SEE FIG. 7F-2
498
502
web address 2
web address 2
GMail Innovativelee Email ETS FB KLD
Other Bookmarks
Saturday, March 10
Activity
Sedentary 9hrs, 18min (Longest Period 1h 8 m)
Walking 3hrs, 25min
Running 0hrs, 31min
Vehicle 2hrs, 20min
Locations
Home 0hrs, 49min
Office 0hrs, 0min
Misc 12hrs, 25min
1AM 2AM 3AM 4AM 5AM 6AM 7AM 8AM 9AM 10AM 11AM NOON 1PM 2PM 3PM 4PM 5PM 6PM 8PM 9PM 10PM 11PM
HOME
LOCATION
LOCATION
COURT'S PARENTS HOUSE
HOME

FIG. 7F-1

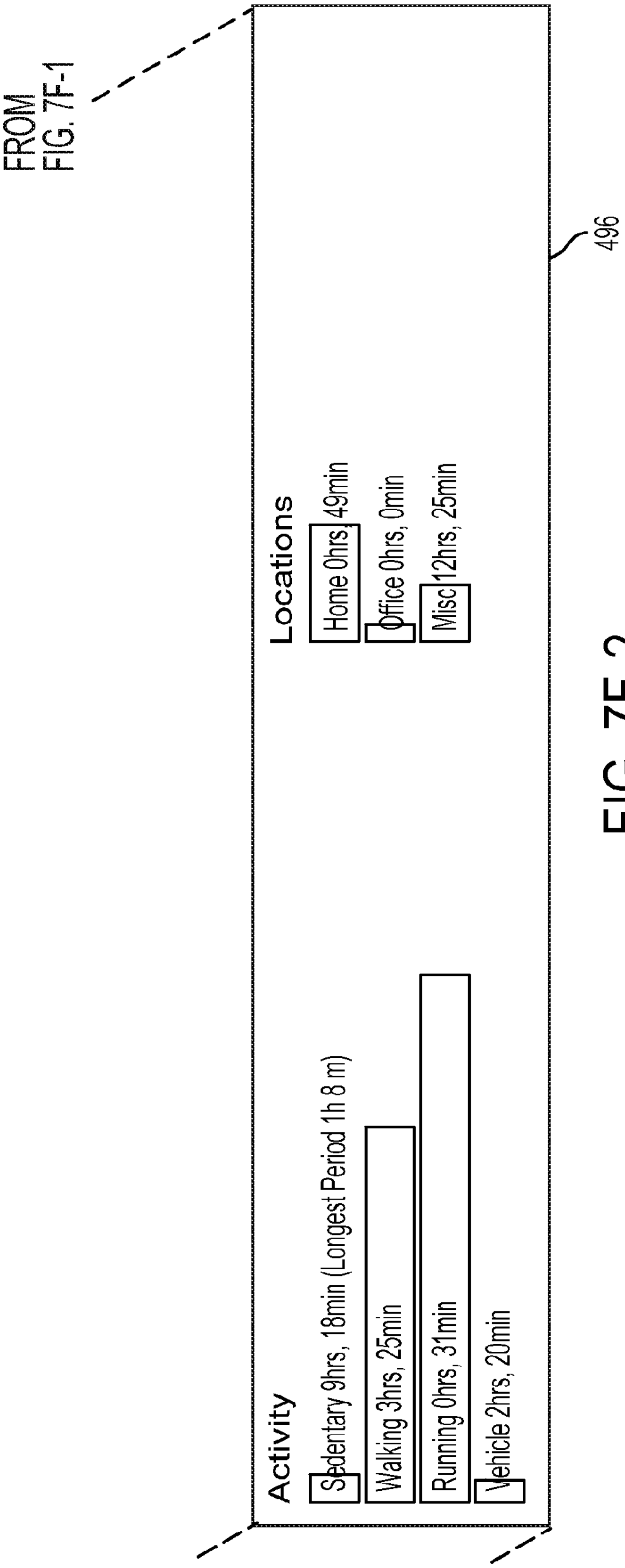
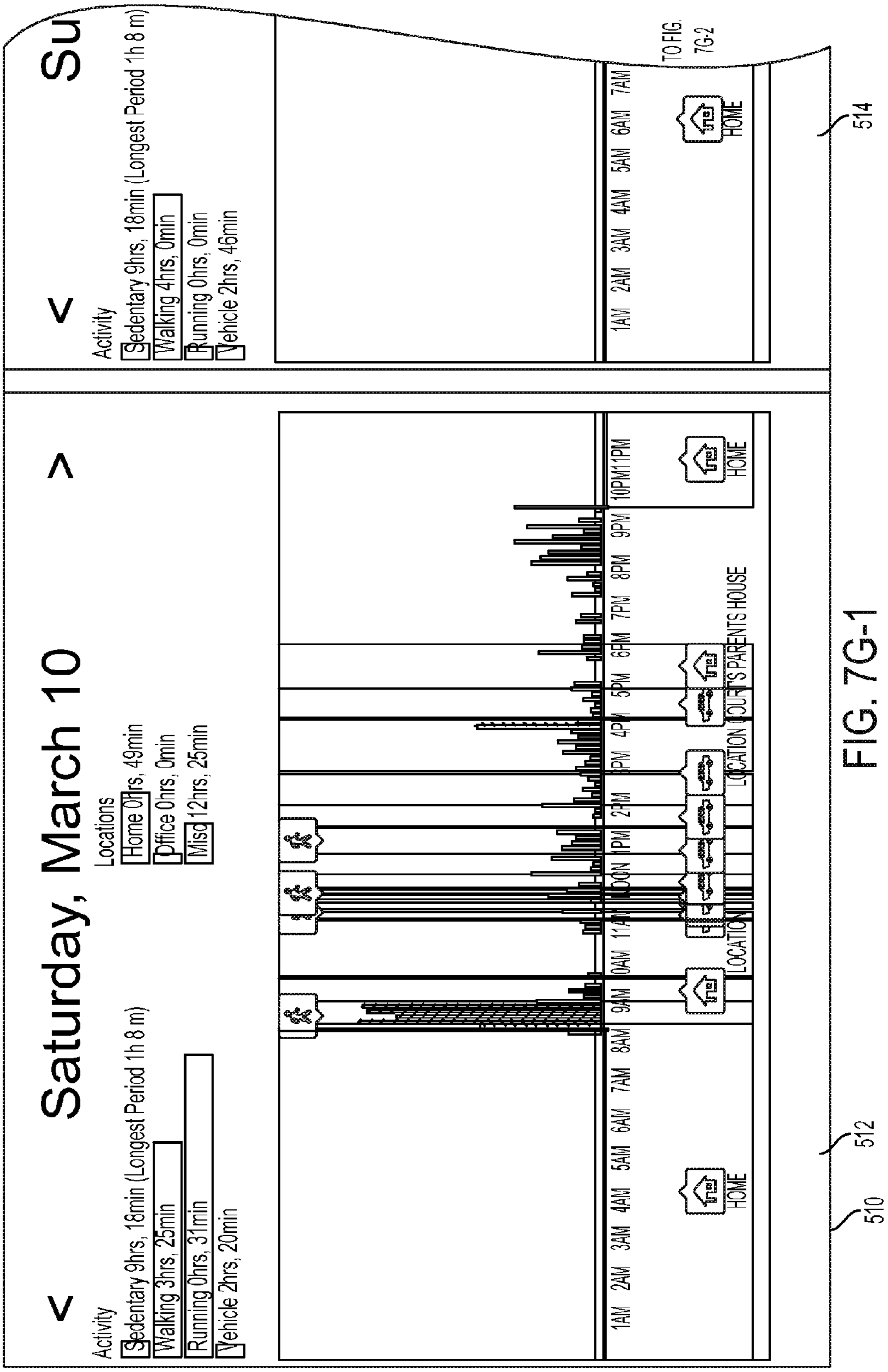
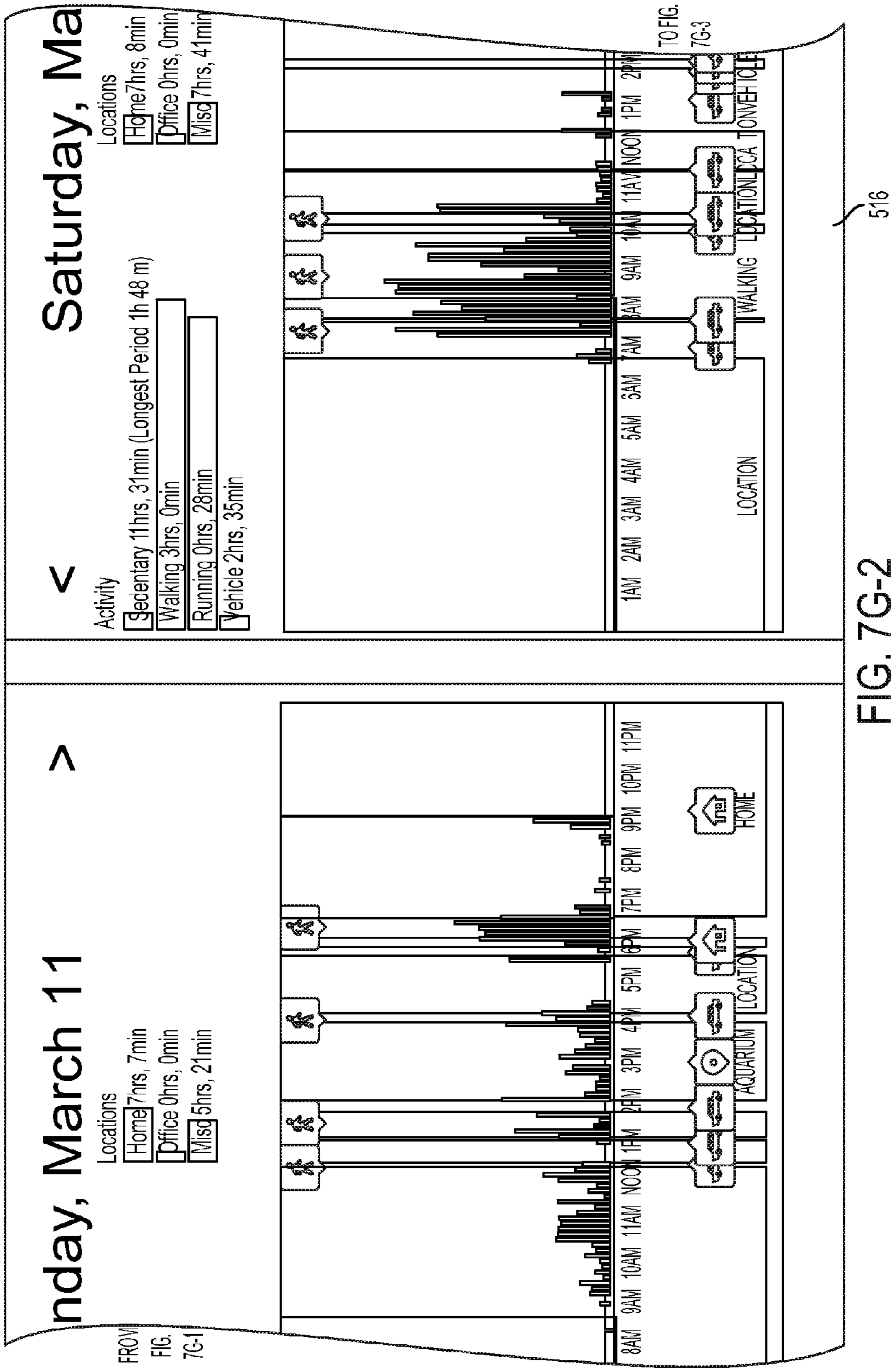

FROM
FIG. 7F-1
496
Activity
Sedentary 9hrs, 18min (Longest Period 1h 8 m)
Walking 3hrs, 25min
Running 0hrs, 31min
Vehicle 2hrs, 20min
Locations
Home 0hrs, 49min
Office 0hrs, 0min
Misc 12hrs, 25min

FIG. 7F-2



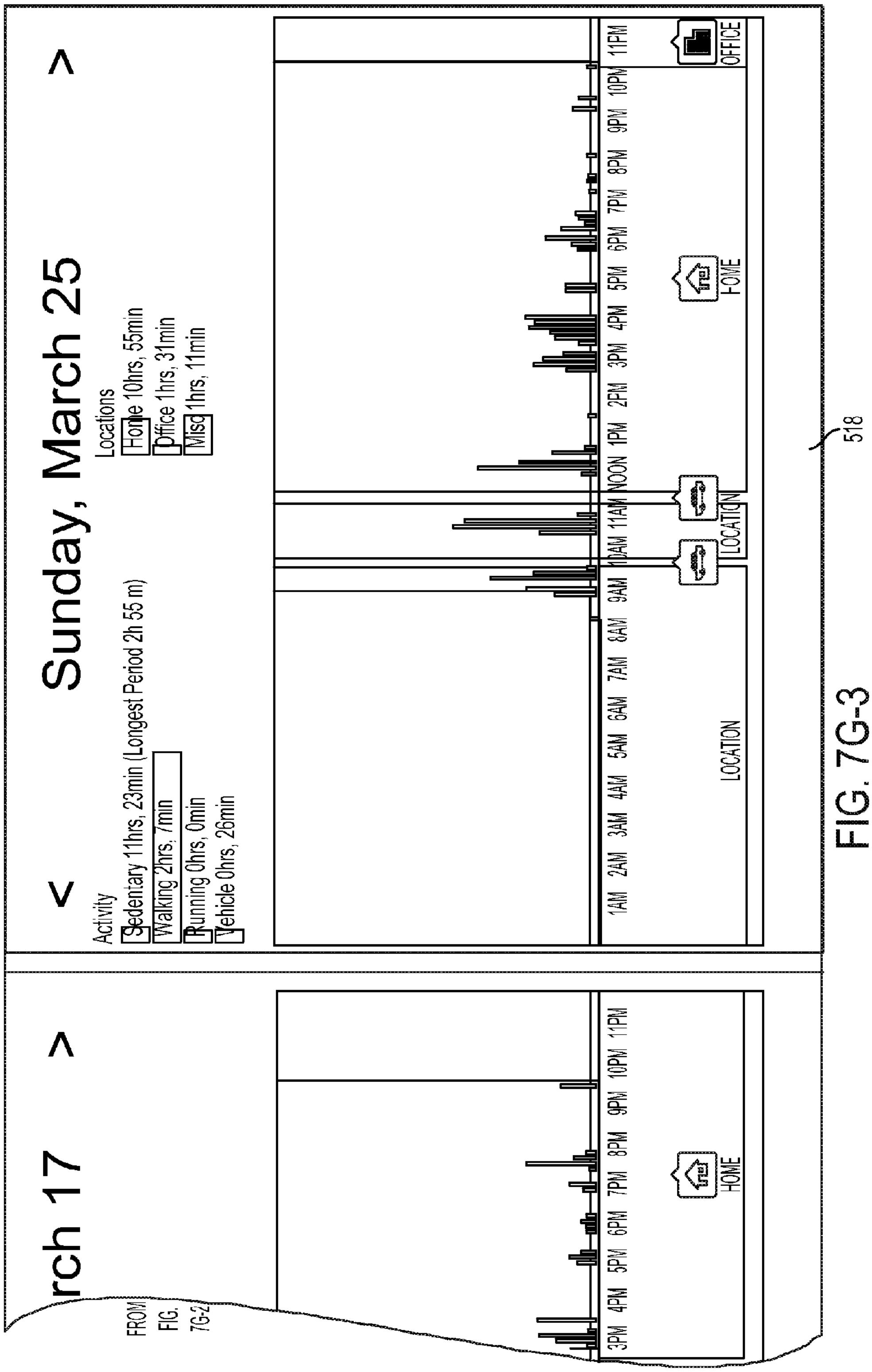
Saturday, March 10
Su
Activity
Sedentary 9hrs, 18min (Longest Period 1h 8 m)
Walking 3hrs, 25min
Running 0hrs, 31min
Vehicle 2hrs, 20min
Locations
Home 0hrs, 49min
Office 0hrs, 0min
Misc 12hrs, 25min
Activity
Sedentary 9hrs, 18min (Longest Period 1h 8 m)
Walking 4hrs, 0min
Running 0hrs, 0min
Vehicle 2hrs, 46min
1AM 2AM 3AM 4AM 5AM 6AM 7AM 8AM 9AM 10AM 11AM NOON 1PM 2PM 3PM 4PM 5PM 6PM 7PM 8PM 9PM 10PM 11PM
1AM 2AM 3AM 4AM 5AM 6AM 7AM
HOME
LOCATION
LOCATION
COURT'S PARENTS HOUSE
HOME
HOME
TO FIG. 7G-2
510
512
514

FIG. 7G-1



nday, March 11
Locations
Home 7hrs, 7min
Office 0hrs, 0min
Misc 5hrs, 21min
FROM FIG. 7G-1
8AM 9AM 10AM 11AM NOON 1PM 2PM 3PM 4PM 5PM 6PM 7PM 8PM 9PM 10PM 11PM
AQUARIUM
LOCATION
HOME
Saturday, Ma
Activity
Sedentary 11hrs, 31min (Longest Period 1h 48 m)
Walking 3hrs, 0min
Running 0hrs, 28min
Vehicle 2hrs, 35min
Locations
Home 7hrs, 8min
Office 0hrs, 0min
Misc 7hrs, 41min
1AM 2AM 3AM 4AM 5AM 3AM 7AM 8AM 9AM 10AM 11AM NOON 1PM 2PM
LOCATION
WALKING
TO FIG. 7G-3
516

FIG. 7G-2



Sunday, March 25
Activity
Sedentary 11hrs, 23min (Longest Period 2h 55 m)
Walking 2hrs, 7min
Running 0hrs, 0min
Vehicle 0hrs, 26min
Locations
Home 10hrs, 55min
Office 1hrs, 31min
Misc 1hrs, 11min
1AM 2AM 3AM 4AM 5AM 6AM 7AM 8AM 9AM 10AM 11AM NOON 1PM 2PM 3PM 4PM 5PM 6PM 7PM 8PM 9PM 10PM 11PM
LOCATION
LOCATION
HOME
OFFICE
518
rch 17
3PM 4PM 5PM 6PM 7PM 8PM 9PM 10PM 11PM
HOME
FROM FIG. 7G-2

FIG. 7G-3

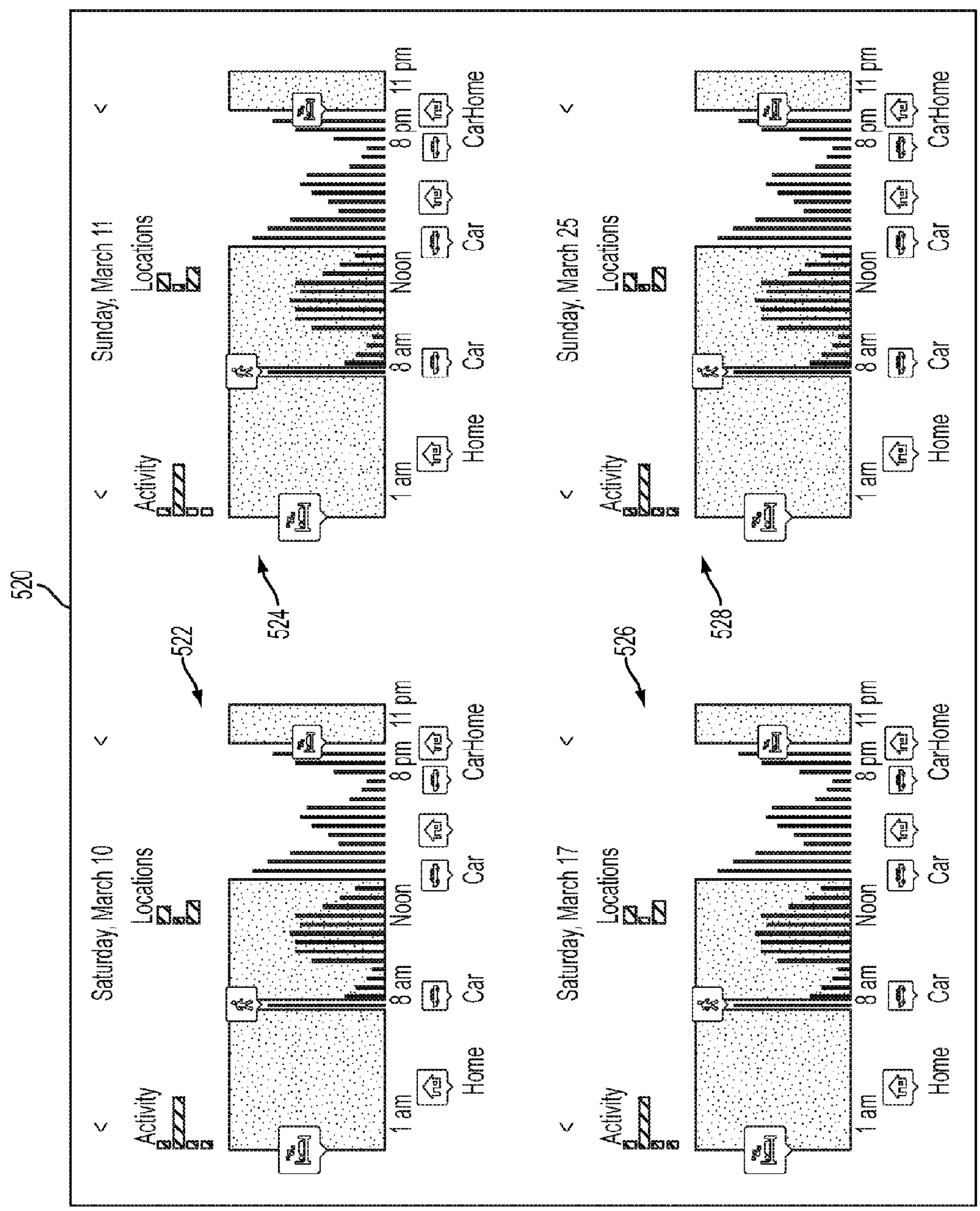

520
522
524
526
528
Saturday, March 10
Sunday, March 11
Saturday, March 17
Sunday, March 25
Activity
Locations
1 am
8 am
Noon
8 pm
11 pm
Home
Car
Car
CarHome

FIG. 7H

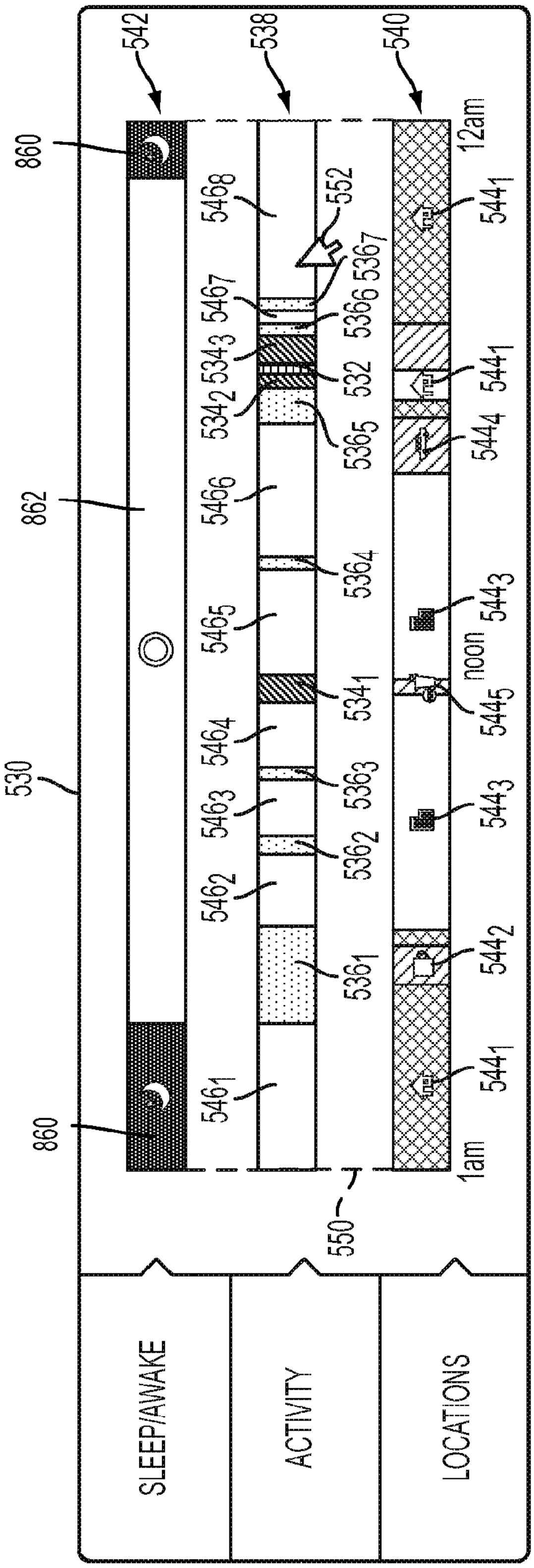

SLEEP/AWAKE
ACTIVITY
LOCATIONS
12am
noon
1am
530
538
540
542
550
552
532
860
862

FIG. 7I

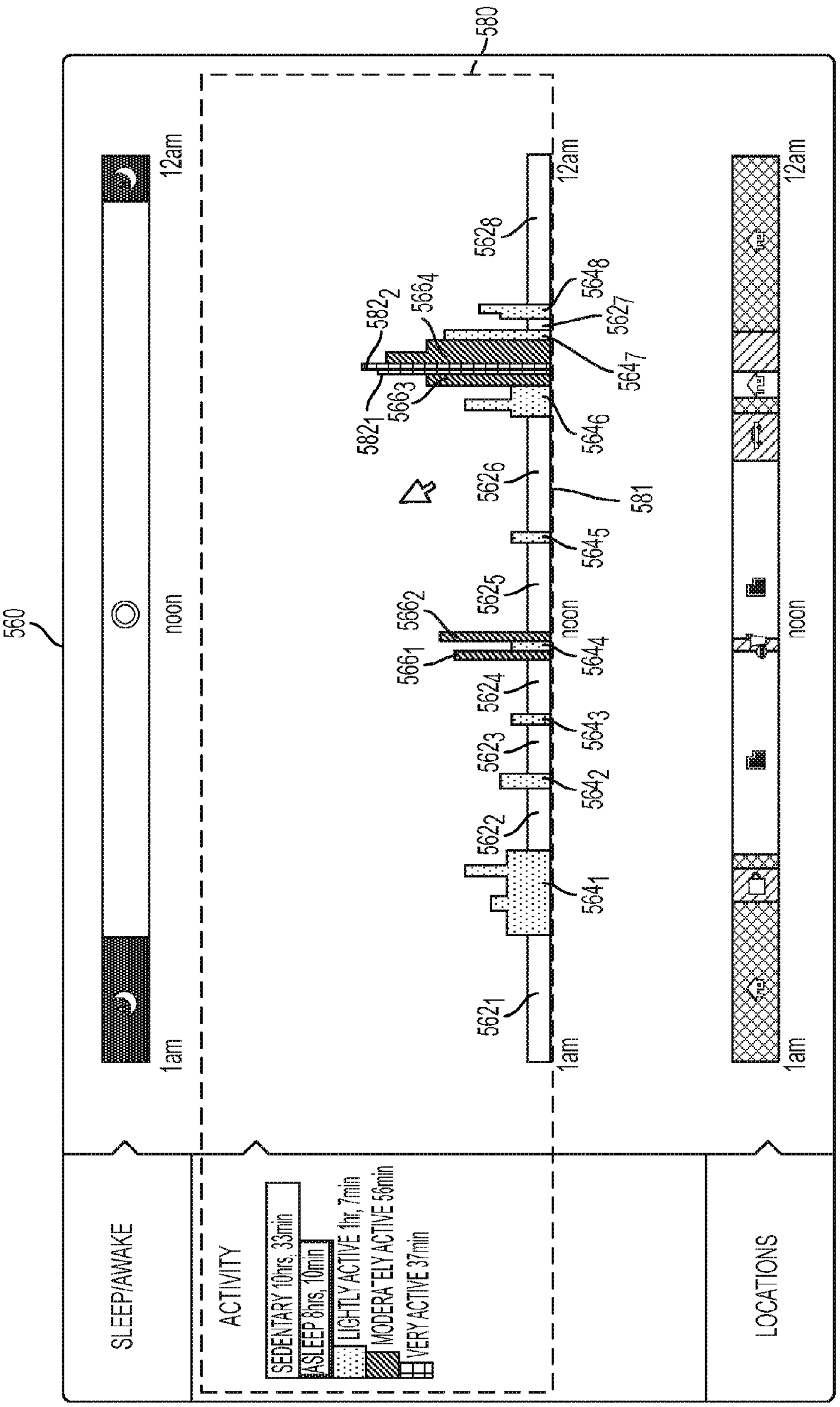

560
580
SLEEP/AWAKE
1am
noon
12am
ACTIVITY
SEDENTARY 10hrs, 33min
ASLEEP 8hrs, 10min
LIGHTLY ACTIVE 1hr, 7min
MODERATELY ACTIVE 56min
VERY ACTIVE 37min
5621
5622
5623
5624
5625
5626
5627
5628
5641
5642
5643
5644
5645
5646
5647
5648
5661
5662
5663
5664
5821
5822
581
LOCATIONS

FIG. 7J

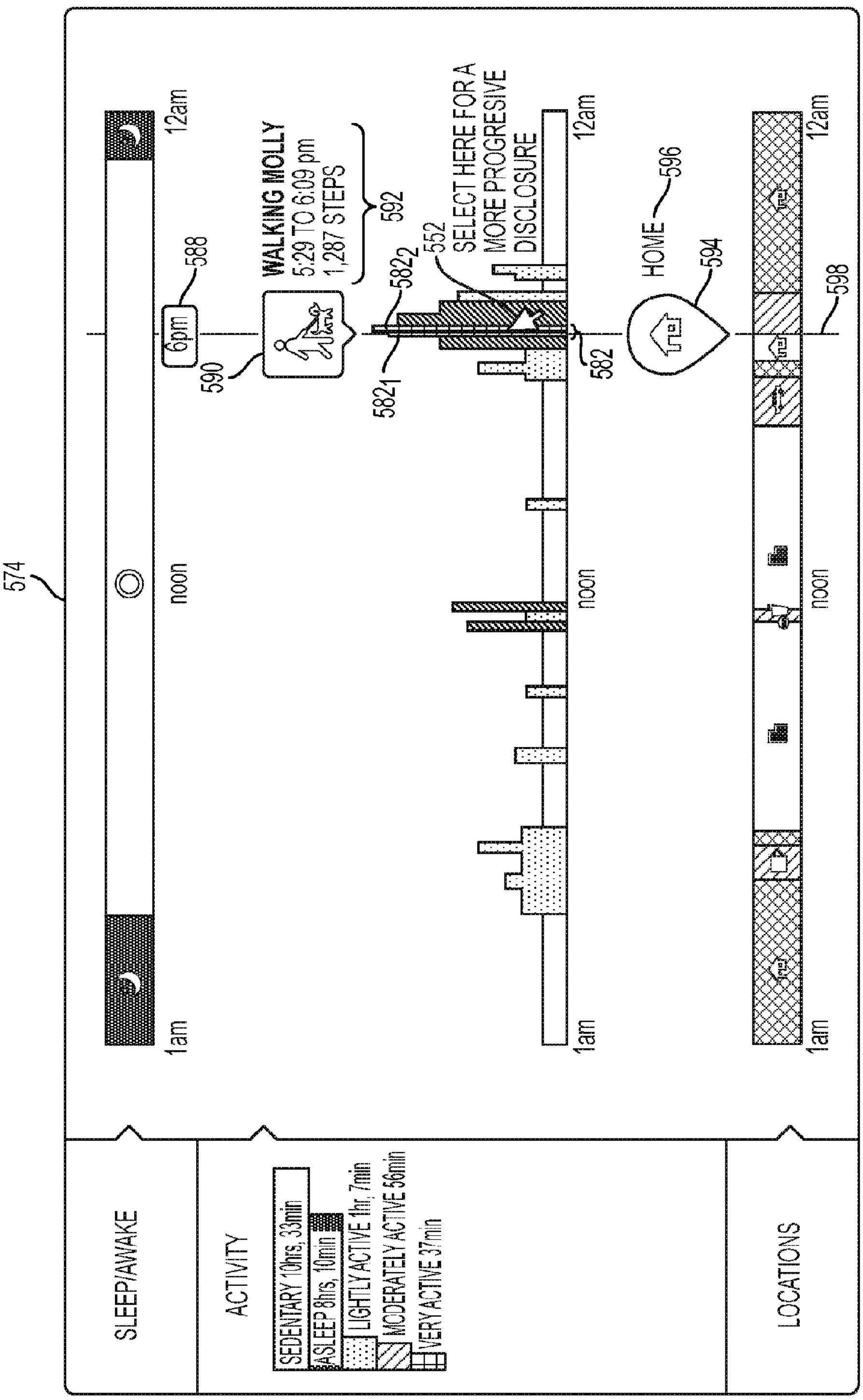

574
SLEEP/AWAKE
ACTIVITY
SEDENTARY 10hrs, 33min
ASLEEP 8hrs, 10min
LIGHTLY ACTIVE 4hr, 7min
MODERATELY ACTIVE 56min
VERY ACTIVE 37min
LOCATIONS
1am
noon
12am
6pm
588
590
WALKING MOLLY
5:29 TO 6:09 pm
1,287 STEPS
592
5821
5822
552
582
SELECT HERE FOR A MORE PROGRESIVE DISCLOSURE
HOME
596
594
598

FIG. 7K

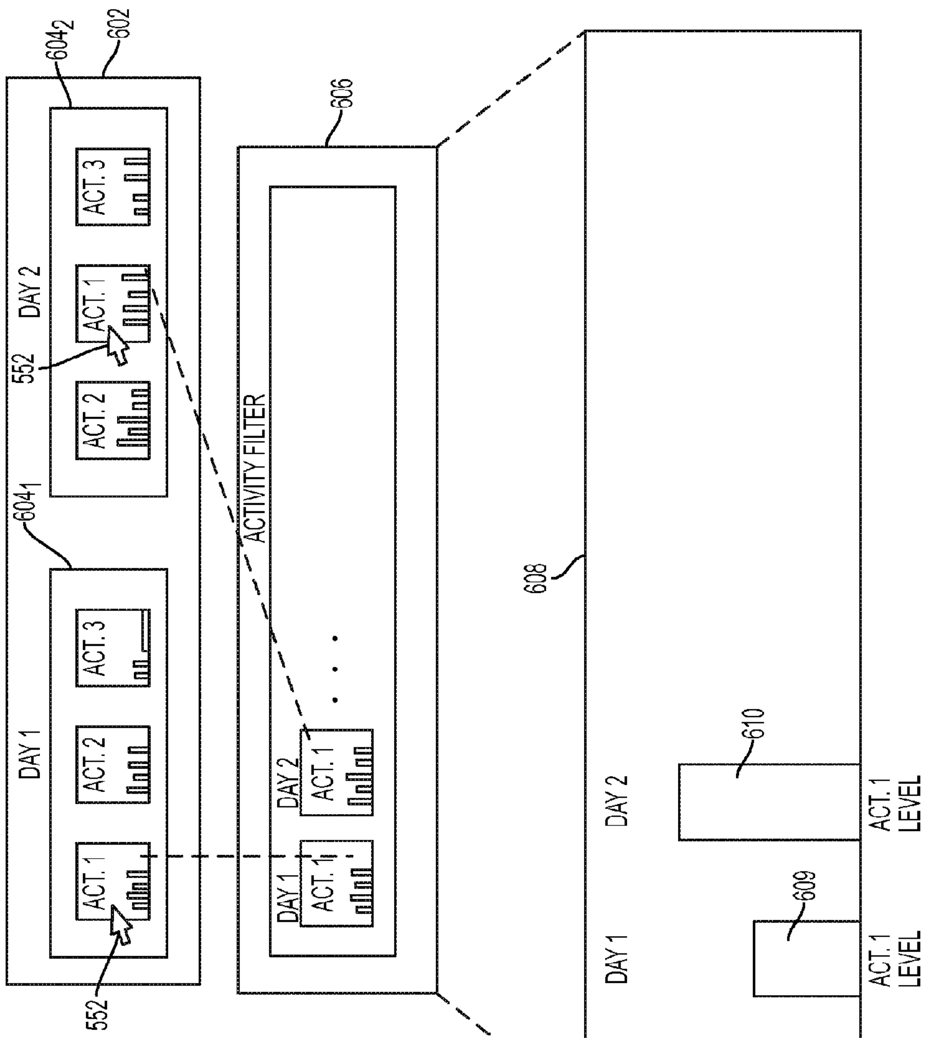

602
604₂
604₁
DAY 1
DAY 2
ACT. 1
ACT. 2
ACT. 3
552
606
ACTIVITY FILTER
608
609
610
ACT. 1 LEVEL

FIG. 7L

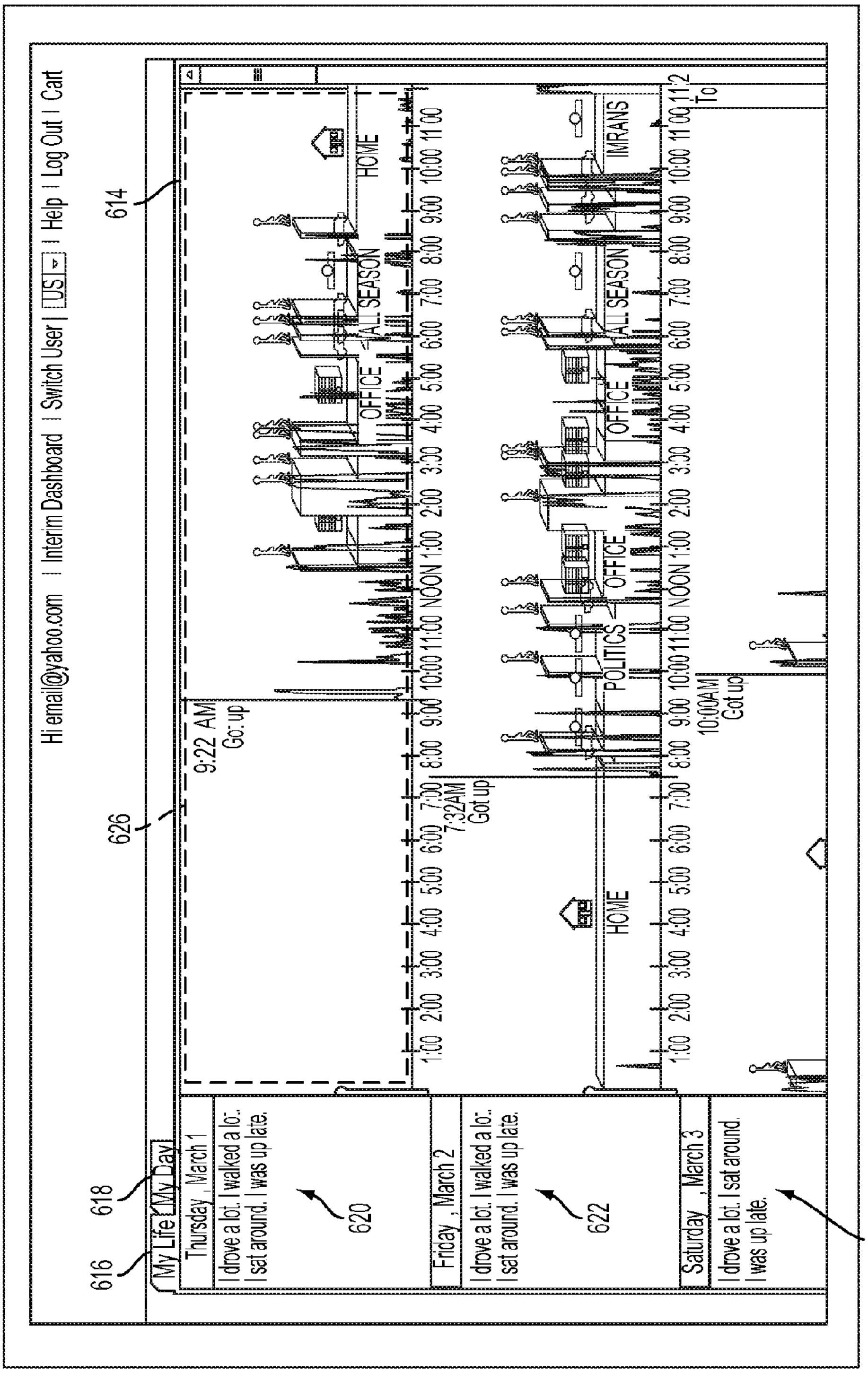

Hi email@yahoo.com
Interim Dashboard
Switch User
US
Help
Log Out
Cart
614
626
616
618
My Life
My Day
Thursday , March 1
I drove a lot. I walked a lot. I sat around. I was up late.
620
Friday , March 2
I drove a lot. I walked a lot. I sat around. I was up late.
622
Saturday , March 3
I drove a lot. I sat around. I was up late.
624
9:22 AM
Got up
7:32AM
Got up
10:00AM
Got up
HOME
OFFICE
ALL SEASON
POLITICS
IMRANS
1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 NOON 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00

FIG. 7M

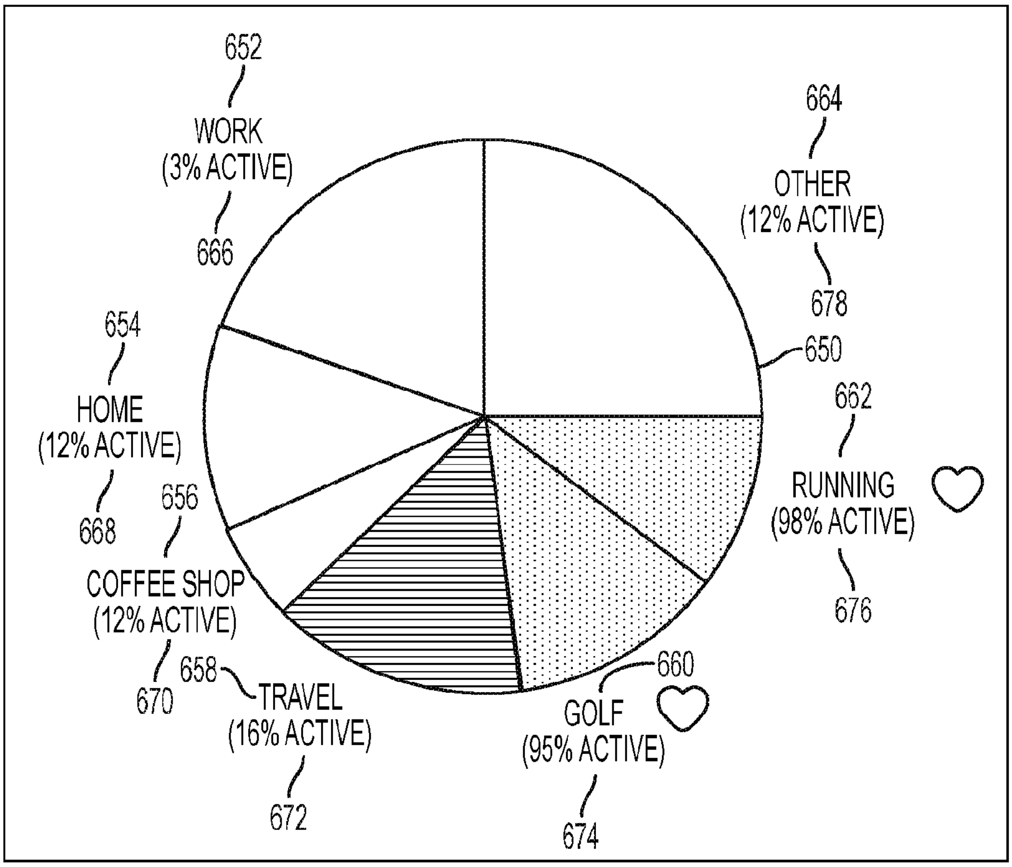

652
WORK
(3% ACTIVE)
666
664
OTHER
(12% ACTIVE)
678
650
654
HOME
(12% ACTIVE)
668
662
RUNNING
(98% ACTIVE)
676
656
COFFEE SHOP
(12% ACTIVE)
670
658
TRAVEL
(16% ACTIVE)
672
660
GOLF
(95% ACTIVE)
674

FIG. 7N

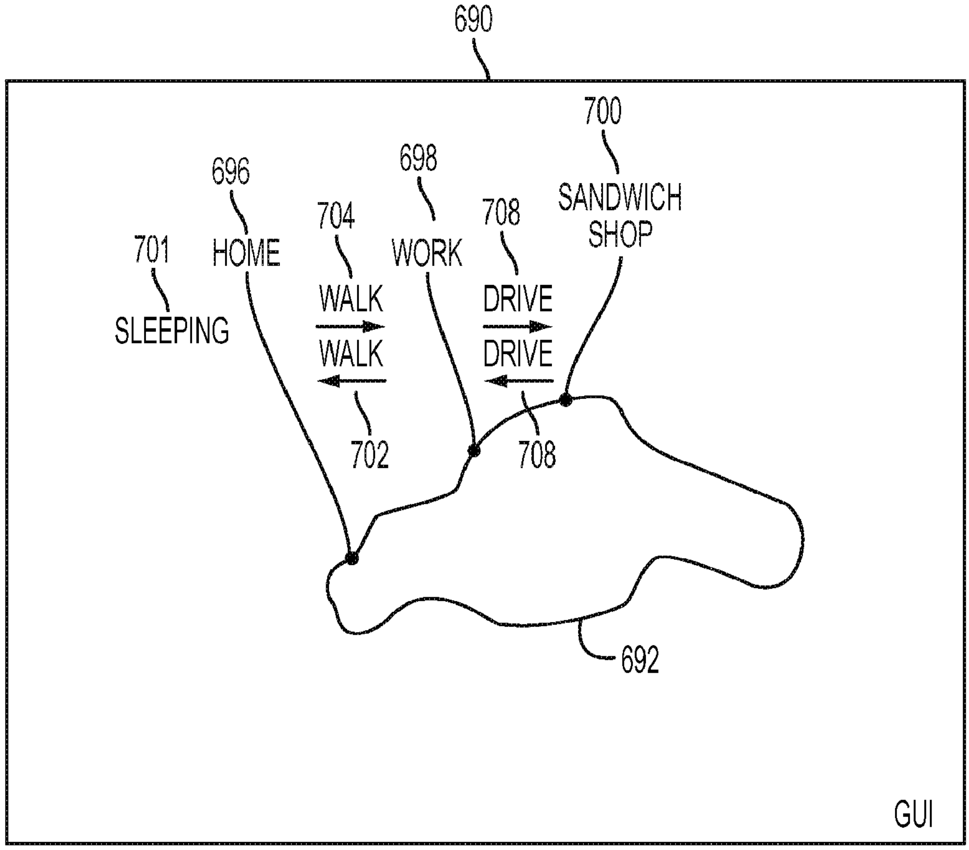

690
700
SANDWICH
SHOP
696
698
704
708
701
HOME
WORK
WALK
DRIVE
SLEEPING
WALK
DRIVE
702
708
692
GUI

FIG. 7O

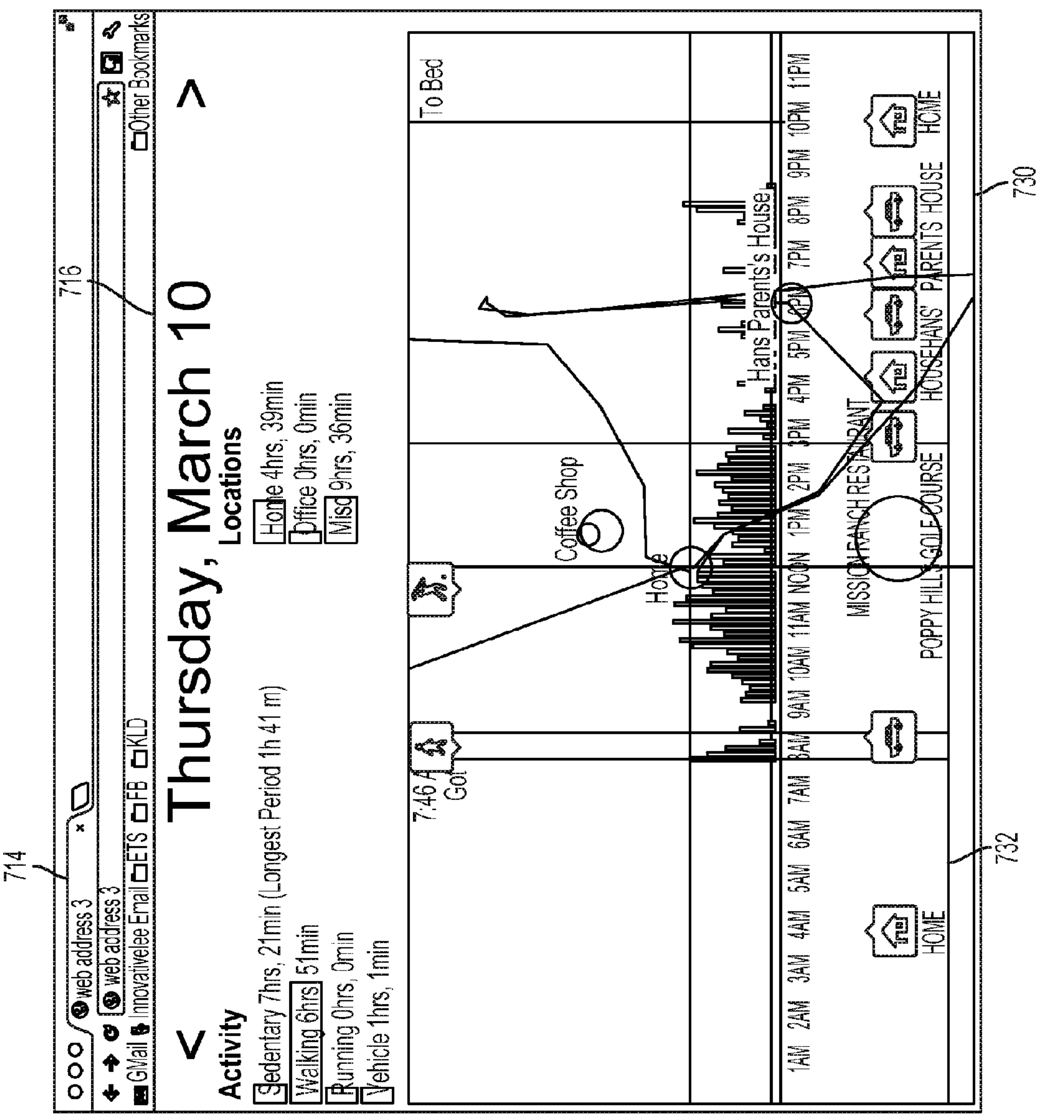

714
716
730
732
web address 3
GMail Innovativelee Email ETS FB KLD
Other Bookmarks
Thursday, March 10
Activity
Sedentary 7hrs, 21min (Longest Period 1h 41 m)
Walking 6hrs 51min
Running 0hrs, 0min
Vehicle 1hrs, 1min
Locations
Home 4hrs, 39min
Office 0hrs, 0min
Misc 9hrs, 36min
To Bed
Coffee Shop
Home
Hans Parents's House
MISSION RANCH RESTAURANT
POPPY HILLS GOLF COURSE
HOME
HANS' PARENTS HOUSE
1AM 2AM 3AM 4AM 5AM 6AM 7AM 8AM 9AM 10AM 11AM NOON 1PM 2PM 3PM 4PM 5PM 6PM 7PM 8PM 9PM 10PM 11PM

FIG. 7P

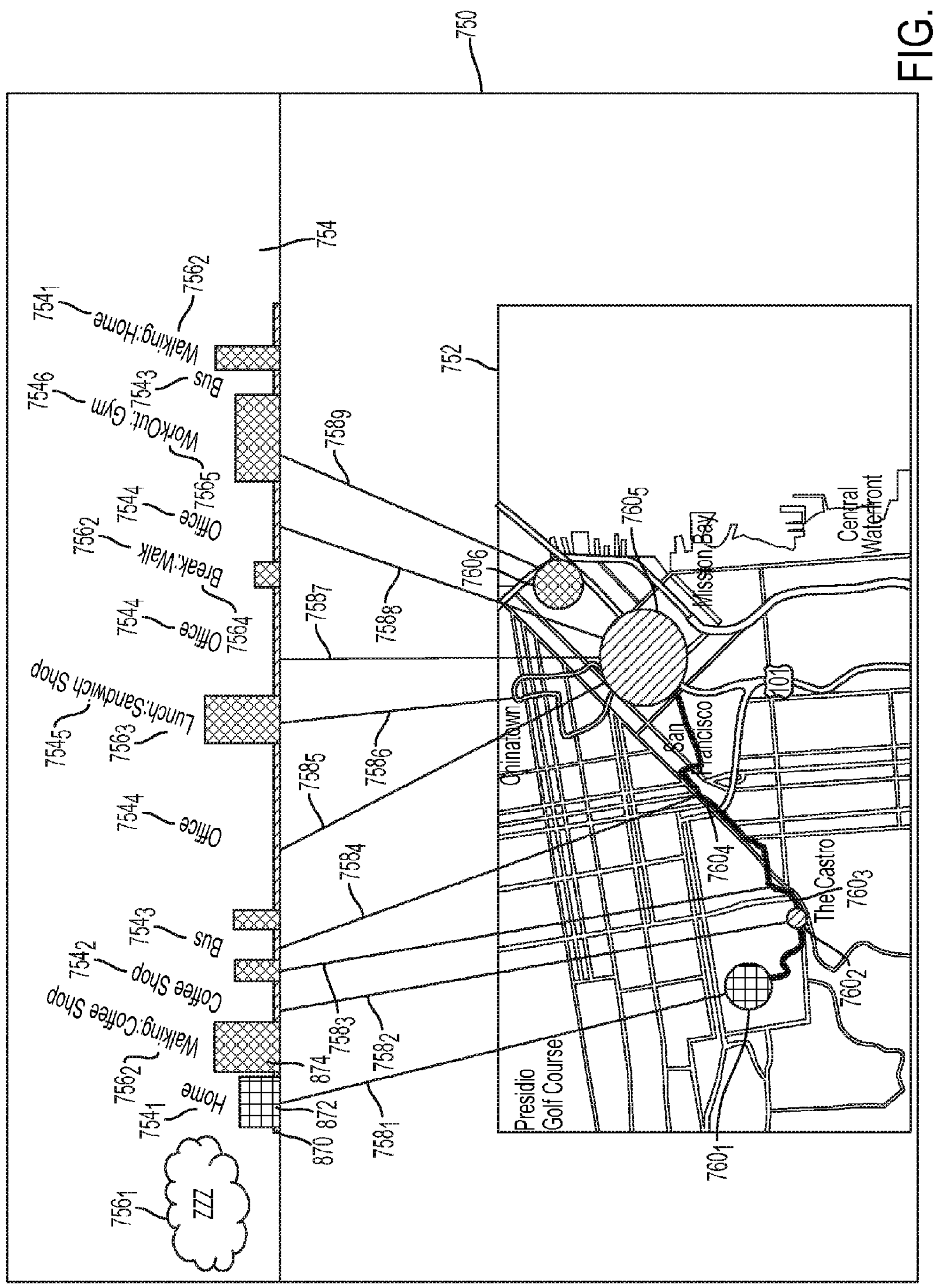

750
752
754
ZZZ
Home
Walking:Coffee Shop
Coffee Shop
Bus
Office
Lunch:Sandwich Shop
Office
Break:Walk
Office
WorkOut, Gym
Bus
Walking:Home
Presidio Golf Course
Chinatown
San Francisco
The Castro
Mission Bay
Central Waterfront
101
870
872
874

FIG. 7Q

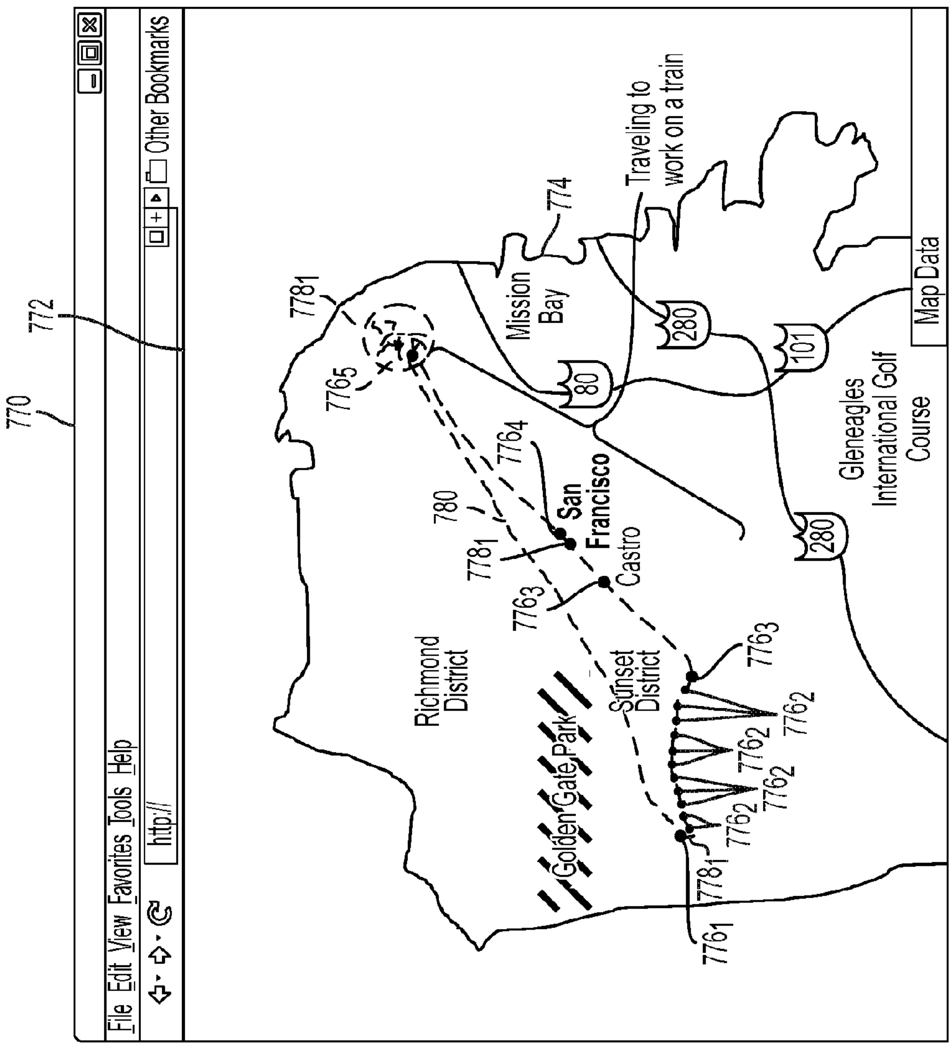
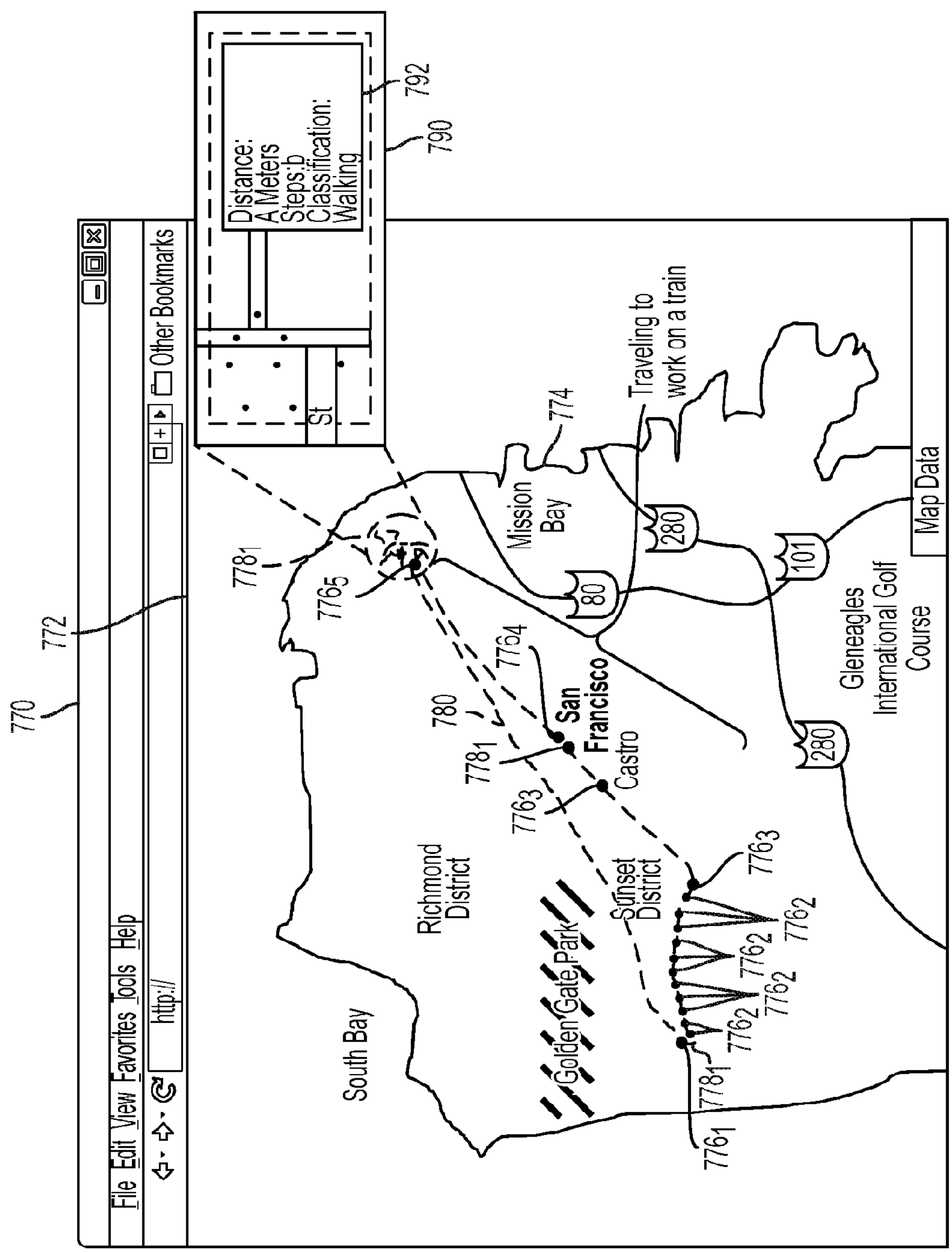

770
772
File Edit View Favorites Tools Help
http://
Other Bookmarks
Richmond District
Golden Gate Park
Sunset District
San Francisco
Castro
Mission Bay
774
Traveling to work on a train
80
280
101
280
Gleneagles International Golf Course
Map Data
780
7781
7765
7764
7763
7762
7761

FIG. 7R



770
772
File Edit View Favorites Tools Help
http://
Other Bookmarks
Distance:
A Meters
Steps:b
Classification:
Walking
792
790
St
774
Traveling to work on a train
Mission Bay
280
80
101
280
Map Data
Gleneagles International Golf Course
7781
7765
7764
780
San Francisco
7781
Castro
7763
Richmond District
Sunset District
Golden Gate Park
South Bay
7763
7762
7762
7762
7762
7781
7761

FIG. 7S

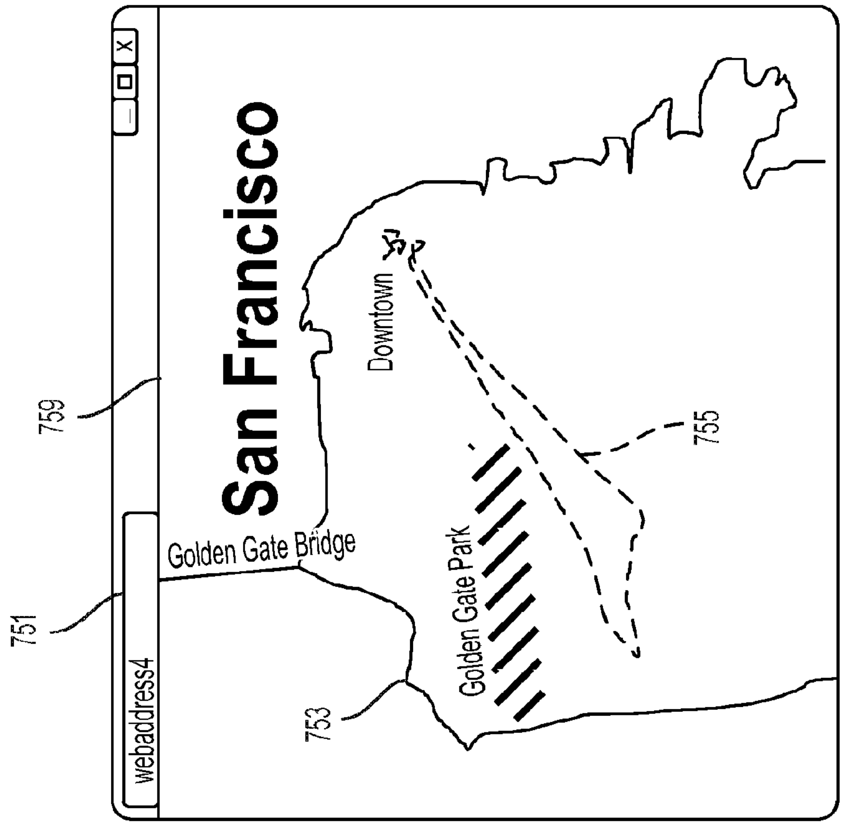

webaddress4
San Francisco
Golden Gate Bridge
Golden Gate Park
Downtown
751
759
753
755

FIG. 7T

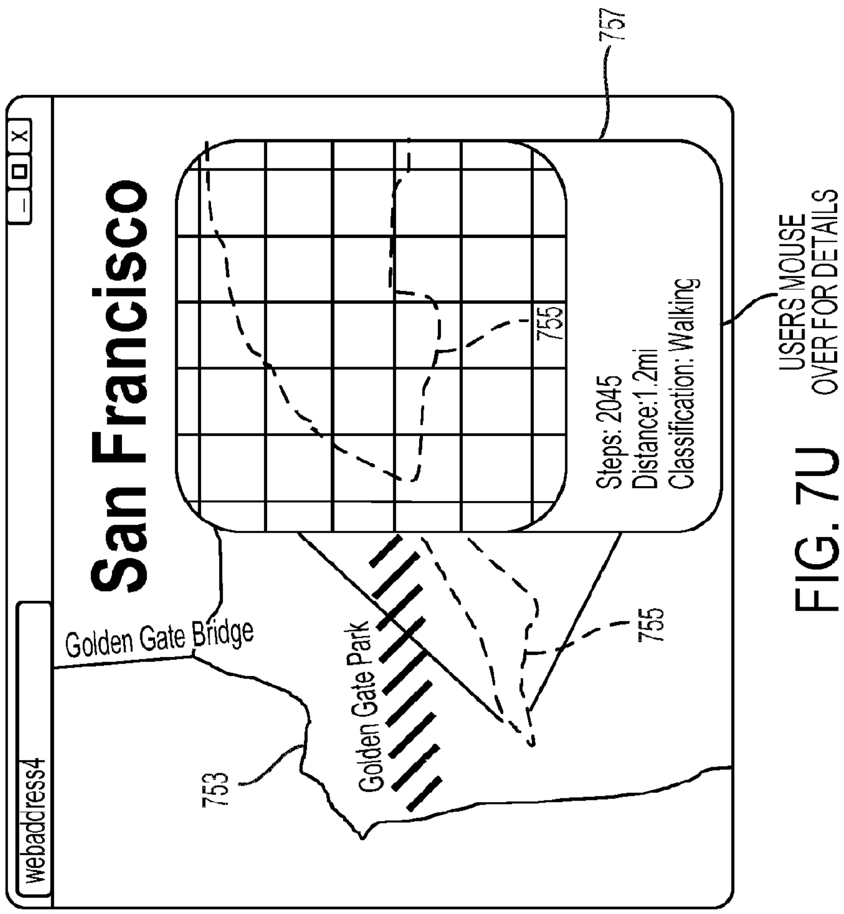
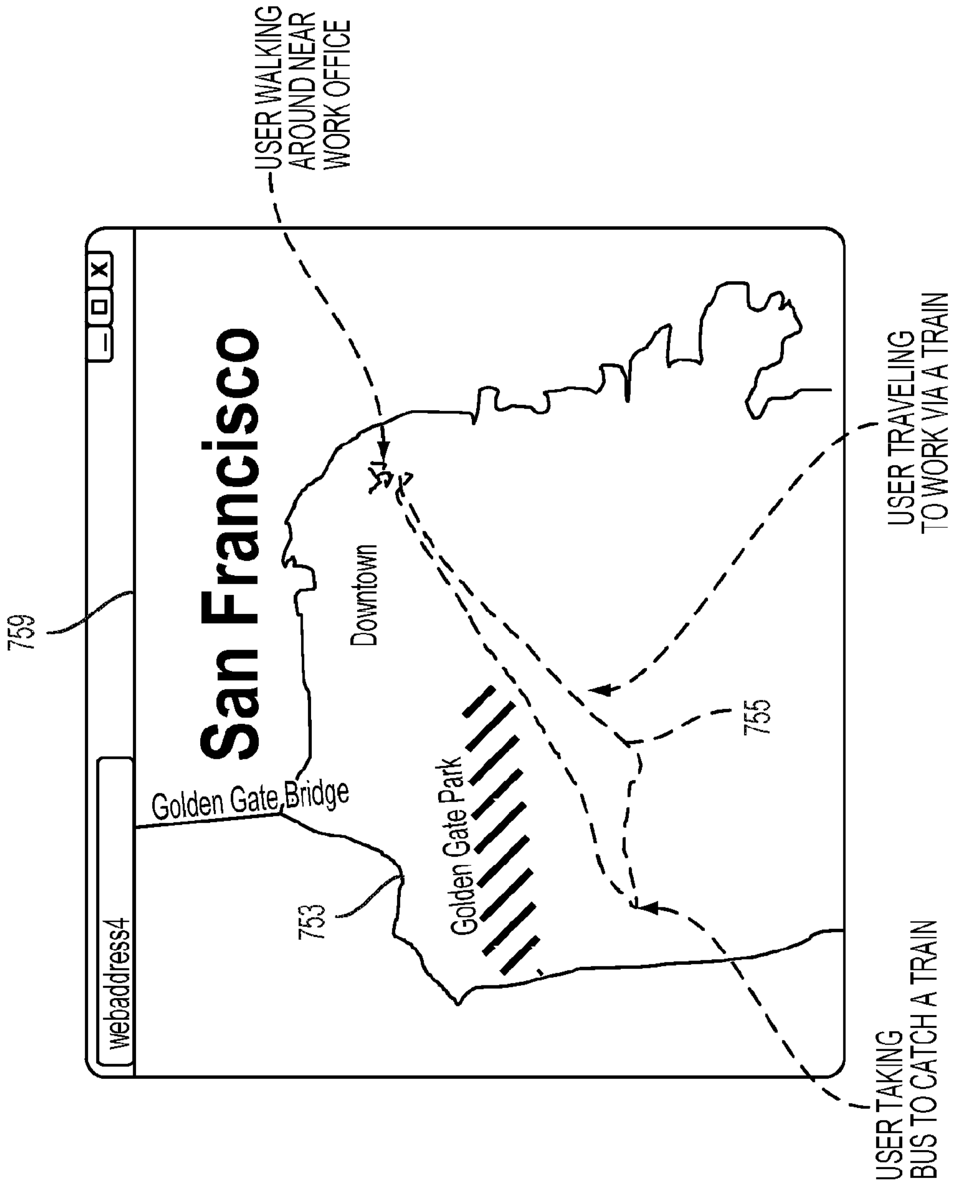

webaddress4
San Francisco
Golden Gate Bridge
Golden Gate Park
Steps: 2045
Distance:1.2mi
Classification: Walking
USERS MOUSE OVER FOR DETAILS
753
755
757

FIG. 7U



759
webaddress4
San Francisco
Golden Gate Bridge
Downtown
Golden Gate Park
753
755
USER WALKING AROUND NEAR WORK OFFICE
USER TRAVELING TO WORK VIA A TRAIN
USER TAKING BUS TO CATCH A TRAIN

FIG. 7V

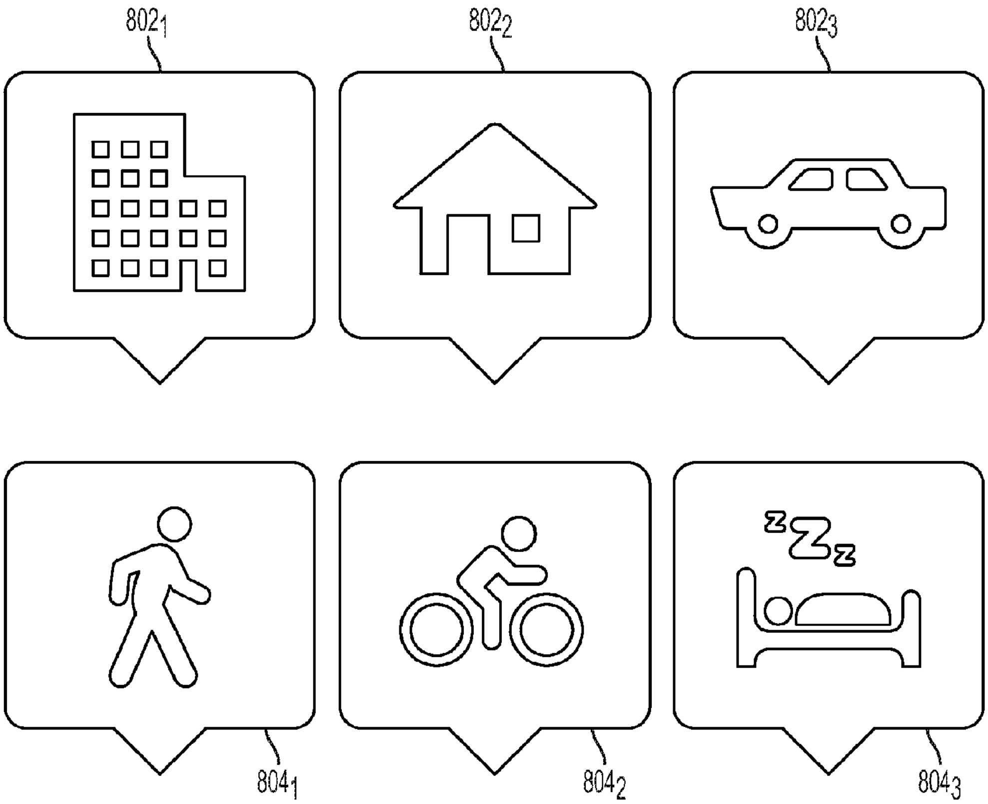


FIG. 8

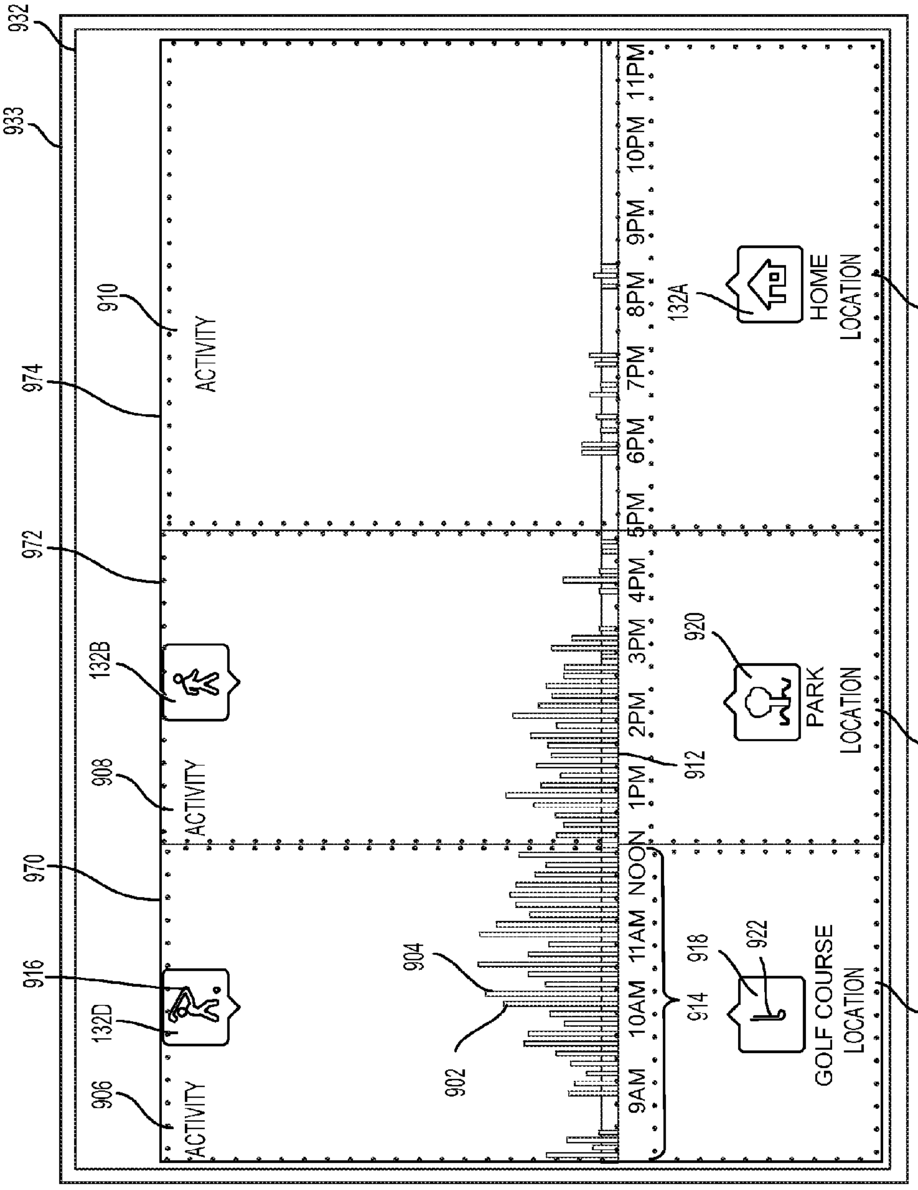

932
933
974
972
970
916
132D
906
ACTIVITY
908
ACTIVITY
132B
910
ACTIVITY
904
902
9AM
10AM
11AM
NOON
1PM
2PM
3PM
4PM
5PM
6PM
7PM
8PM
9PM
10PM
11PM
912
914
918
922
GOLF COURSE LOCATION
926
920
PARK LOCATION
928
132A
HOME LOCATION
930

FIG. 9

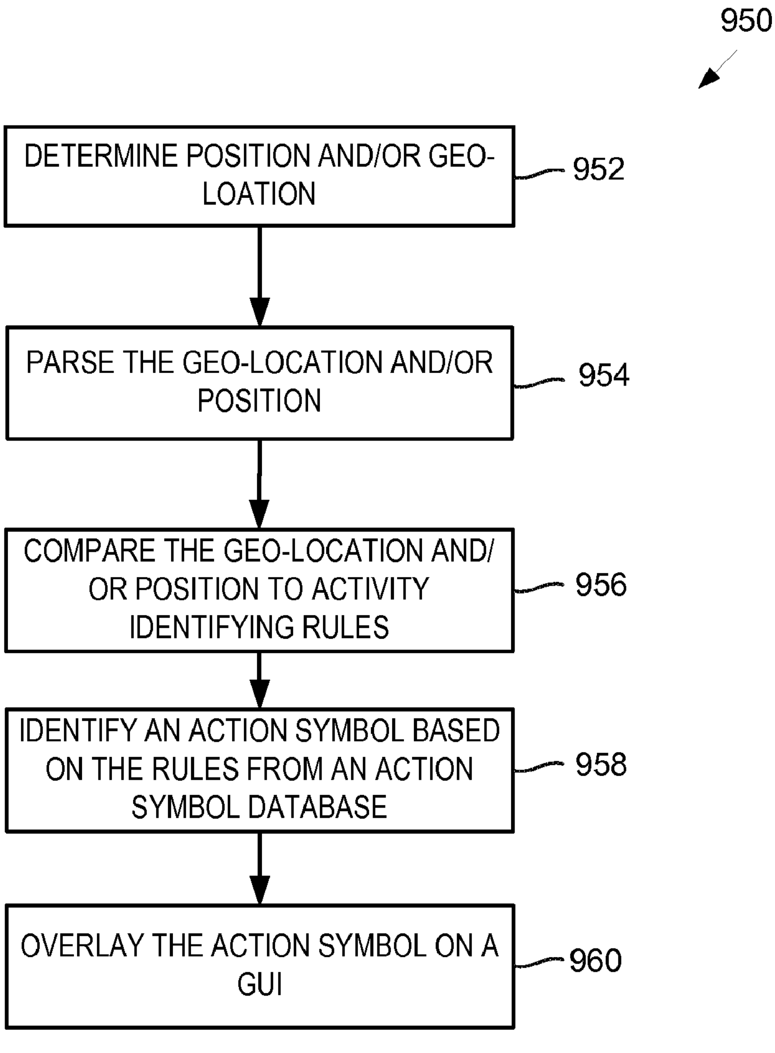

950
DETERMINE POSITION AND/OR GEO-LOATION
952
PARSE THE GEO-LOCATION AND/OR POSITION
954
COMPARE THE GEO-LOCATION AND/OR POSITION TO ACTIVITY IDENTIFYING RULES
956
IDENTIFY AN ACTION SYMBOL BASED ON THE RULES FROM AN ACTION SYMBOL DATABASE
958
OVERLAY THE ACTION SYMBOL ON A GUI
960

FIG. 10

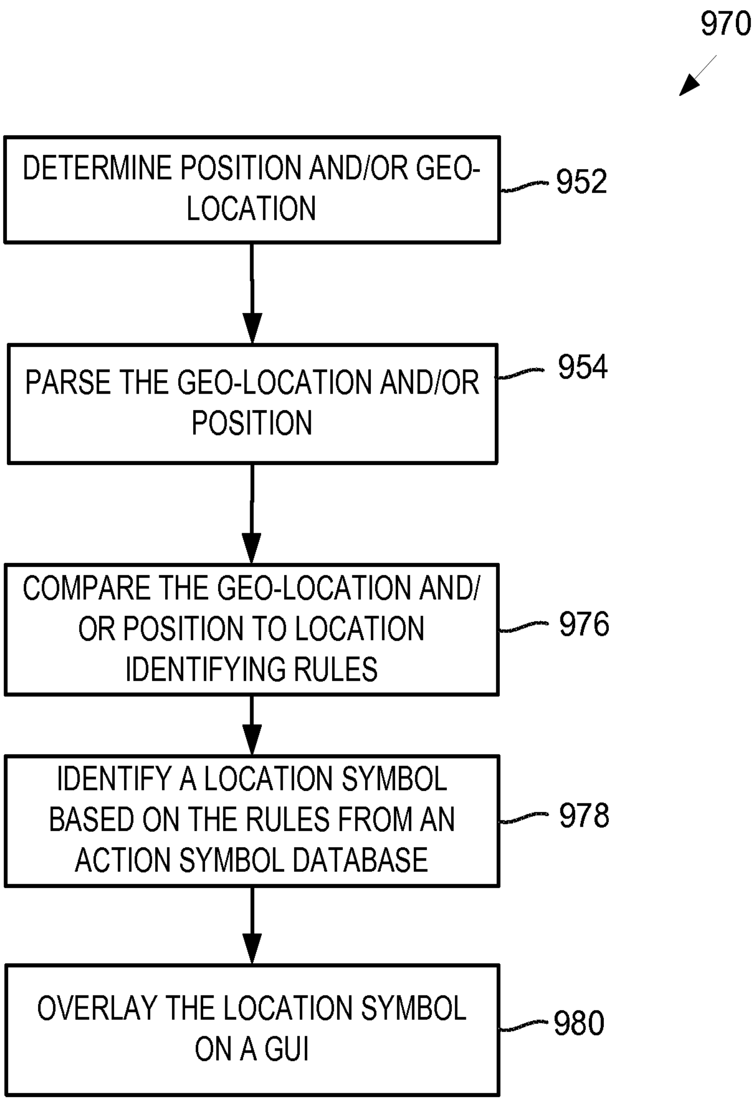

970
DETERMINE POSITION AND/OR GEO-LOCATION
952
PARSE THE GEO-LOCATION AND/OR POSITION
954
COMPARE THE GEO-LOCATION AND/OR POSITION TO LOCATION IDENTIFYING RULES
976
IDENTIFY A LOCATION SYMBOL BASED ON THE RULES FROM AN ACTION SYMBOL DATABASE
978
OVERLAY THE LOCATION SYMBOL ON A GUI
980

FIG. 11

METHODS AND SYSTEMS FOR GENERATION AND RENDERING INTERACTIVE EVENTS HAVING COMBINED ACTIVITY AND LOCATION INFORMATION

CLAIM OF PRIORITY

This application is a continuation of and claims the benefit, under 35 U.S.C. §120, of co-pending U.S. patent application Ser. No. 14/249,087, filed on Apr. 9, 2014, and entitled "Methods and Systems for Generation and Rendering Interactive Events Having Combined Activity and Location Information", which is a continuation of and claims the benefit, under 35 U.S.C. §120, of U.S. patent application Ser. No. 13/959,717, filed on Aug. 5, 2013, entitled "Methods and Systems for Generation and Rendering Interactive Events Having Combined Activity and Location Information", and issued as U.S. Pat. No. 8,762,102, which claims the benefit of and priority, under 35 U.S.C. §119(e), to a Provisional Patent Application No. 61/680,230, filed on Aug. 6, 2012, and entitled "GPS Enabled Activity and Sleep Tracker", all of which are incorporated by reference herein in their entirety.

The application Ser. No. 13/959,717 is a continuation-in-part of U.S. patent application Ser. No. 13/693,334, now U.S. Pat. No. 8,548,770, filed on Dec. 4, 2012, titled "Portable Monitoring Devices and Methods for Operating Same", which is a divisional of U.S. patent application Ser. No. 13/667,229, now U.S. Pat. No. 8,437,980, filed on Nov. 2, 2012, titled "Portable Monitoring Devices and Methods for Operating Same", which is a divisional of U.S. patent application Ser. No. 13/469,027, now U.S. Pat. No. 8,311,769, filed on May 10, 2012, titled "Portable Monitoring Devices and Methods for Operating Same", which is a divisional of U.S. patent application Ser. No. 13/246,843, now U.S. Pat. No. 8,180,591, filed on Sep. 27, 2011, which is a divisional of U.S. patent application Ser. No. 13/156,304, published as U.S. Patent Application Publication No. 2012-0083715, filed on Jun. 8, 2011, titled "Portable Monitoring Devices and Methods for Operating Same", which claims the benefit of and priority to, under 35 U.S.C. §119(e), to U.S. Provisional Patent Application No. 61/388,595, filed on Sep. 30, 2010, and titled "Portable Monitoring Devices and Methods for Operating Same" and to U.S. Provisional Patent Application No. 61/390,811, filed on Oct. 7, 2010, and titled "Portable Monitoring Devices and Methods for Operating Same", all of which are hereby incorporated by reference in their entirety.

The application Ser. No. 13/959,717 is a continuation-in-part of U.S. patent application Ser. No. 13/759,485, now U.S. Pat. No. 8,543,351, filed on Feb. 5, 2013, titled "Portable Monitoring Devices and Methods for Operating Same", which is a divisional of U.S. patent application Ser. No. 13/667,229, now U.S. Pat. No. 8,437,980, filed on Nov. 2, 2012, titled "Portable Monitoring Devices and Methods for Operating Same", which is a divisional of U.S. patent application Ser. No. 13/469,027, now U.S. Pat. No. 8,311,769, filed on May 10, 2012, titled "Portable Monitoring Devices and Methods for Operating Same", which is a divisional of U.S. patent application Ser. No. 13/246,843, now U.S. Pat. No. 8,180,591, filed on Sep. 27, 2011, which is a divisional of U.S. patent application Ser. No. 13/156,304, published as U.S. Patent Application Publication No. 2012-0083715, filed on Jun. 8, 2011, titled "Portable Monitoring Devices and Methods for Operating Same", which claims the benefit of and priority to, under 35 U.S.C. §119(e), to U.S. Provisional Patent Application No. 61/388,595, filed on Sep. 30, 2010, and titled "Portable Monitoring Devices and Methods for Operating Same" and to U.S. Provisional Patent Application No. 61/390,811, filed on Oct. 7, 2010, and titled "Portable Monitoring Devices and Methods for Operating Same", all of which are hereby incorporated by reference in their entirety.

FIELD

The present disclosure relates to systems and methods for capturing activity data over a period of time and associating the captured activity data into identification of locations of a user performing activities.

BACKGROUND

In recent years, the need for health and fitness has grown tremendously. The growth has occurred due to a better understanding of the benefits of good fitness to overall health and wellness. Unfortunately, although today's modern culture has brought about many new technologies, such as the Internet, connected devices and computers, people have become less active. Additionally, many office jobs require people to sit in front of computer screens for long periods of time, which further reduces a person's activity levels. Furthermore, much of today's entertainment options involve viewing multimedia content, computer social networking, and other types of computer involved interfacing. Although such computer activity can be very productive as well as entertaining, such activity tends to reduce a person's overall physical activity.

To provide users concerned with health and fitness a way of measuring or accounting for their activity or lack thereof, fitness tracker are often used. Fitness trackers are used to measure activity, such as walking, motion, running, sleeping, being inactive, bicycling, exercising on an elliptical trainer, and the like. Usually, the data collected by such fitness trackers can be transferred and viewed on a computing device. However, such data is often provided as a basic accumulation of activity data.

It is in this context that embodiments described herein arise.

SUMMARY

Embodiments described in the present disclosure provide systems, apparatus, computer readable media, and methods for segmenting a period of time into identification of locations of a user performing activities. This segmentation provides a way of identifying particular activities to particular locations. Using the segmentations, the systems and methods can identify one or more events that may have occurred during the period of time of activity. In one embodiment, the events can be displayed on a screen of a device, and a user is able to interactively view data concerning the events with contextual information, e.g., where certain events occurred.

In one embodiment, as described below, the events are automatically associated with locations, and the locations can be associated with contextual information concerning the locations. For instance, if a tracking device detects certain activity at a particular location (e.g., a map location), the mapping data or related databases can be queried to determine that the map location corresponds to a golf course. The system can then generate information that is graphically presented to the user, concerning the particular tracked activity as corresponding to golfing. In some embodiments, the locations can be identified over time, e.g., by received user feedback (e.g., this is my home, this is a coffee shop, this is my work).

In some embodiments, the locations can be inferred or learned based on the activities and times of day, and/or repeat activities over a period of time (e.g., based on an identifiable pattern). For example, if the user/tracker is typically experiencing low activity from 9:00 am and 11:55 am, Monday-Friday, it can be inferred using a rules database and learning logic that the user is at work or is working. In another embodiment, the user can be asked, “are you at work?” via a computing device or a tracking device, and based on the user’s response, database can associate particular locations (e.g., geo-location) to particular actual location (e.g., work), and collect the activity data for presentation along with the most appropriate location.

In some embodiments, an activity that is performed by a user is inferred based on geo-locations of a monitoring device or a computing device used by the user. For example, a processor of the monitoring device, of the computing device, of a server, or of a virtual machine determines based on the geo-locations that a user is at a location, e.g., a gym, home, work, etc. The processor retrieves from an activity-location database one or more activities that may be performed by the user at the location. For example, the activity-location database indicates that the user may be performing one or more activities, e.g., using a treadmill, using an elliptical trainer, lifting weights to build resistance, swimming laps, etc., while at a gym. As another example, the activity-location database indicates that the user may be performing one or more activities, e.g., walking, climbing stairs, descending stairs, sleeping, etc., while at home. The processor retrieves one or more of the activities from the activity-location database that correspond to the location and determines that the user is performing one or more of the activities.

Broadly speaking, the systems and methods facilitate determination of an activity level of an activity performed by a user at a location. For example, the systems and methods can determine that the user is sedentary for a particular period of time when the user is at work. As another example, the systems and methods can determine that the user is active when the user is at home. The activity or lack of activity is therefore contextually associated to a particular location. The systems and methods determine activity levels of one or more activities performed by the user during a period of time. The user can view the activity levels of an activity performed at a location and decide whether to perform a different activity at the location, to perform an activity at another location, or to continue performing the activity when at the location. By providing the user location context to activities, the user is able to better view his or her actual activity performance and better health decisions can be made regarding and/or adjustments can be made in lifestyle. For instance, a user may find that walking to the train station can significantly improve his/her health, over taking a bus to the train. These simple decisions in activity can act to significantly increase a person’s activity, but providing context as to what and where activity is taking place can provide better understanding as to how simple changes can have large impacts in overall fitness.

In several embodiments, a computer-implemented method is described. The computer-implemented method is used for populating data of a graphical user interface (GUI). The computer-implemented method includes generating one or more graphical elements of one or more activities captured by a monitoring device. The monitoring device is usable by a user during the capturing. The method further includes generating a timeline including a time period over which the activities are performed. The timeline including a chronological order of time within the time period. The method further includes generating an activity symbol for one or more of the activities performed during the time period. The activity symbol has an image that is graphically overlaid on the graphical elements of the activities.

In some embodiments, a computer-readable medium is described. The computer-readable medium contains programming instructions that cause a computer processor to perform operations. The operations include generating one or more graphical elements including one or more activity levels of one or more activities captured by a monitoring device. The monitoring device is usable by a user during the capturing. The operations further include generating a timeline including a time period over which the activities are performed. The timeline includes a chronological order of time within the time period. The operations include generating an identifier identifying the activities performed, a location at which the activities are performed, or a combination thereof.

In several embodiments, a computer-readable medium is described. The computer-readable medium contains programming instructions that cause a computer processor to perform operations. The operations include generating a first graphical element representing one or more activities determined from positions or geo-locations captured at a location by a monitoring device, which is usable by a user. The operations include generating a second graphical element including an identifier of the location and generating a third graphical element including an identifier of a time at which the activities are performed at the location.

In various embodiments, a computer-readable medium is described. The computer-readable medium contains programming instructions that cause a computer processor to perform operations. The operations include generating one or more graphical elements including one or more activity levels of one or more activities captured by a monitoring device at one or more locations. The monitoring device is usable by a user. The operations further include generating an activity identifier identifying one of the activities performed, generating a location identifier identifying one of the locations at which the activities are performed, and generating a map displayed with respect to the graphical elements, the activity identifier, and the location identifier. The operations include generating a route taken by the monitoring device. The route is displayed on the map.

In several embodiments, a computer-readable medium is described. The computer-readable medium contains programming instructions that cause a computer processor to perform operations. The operations include generating a route captured by a monitoring device, the monitoring device usable by a user. The operations include generating a map presented in front of or behind the route. The route includes one or more identifiers of one or more activities captured by the monitoring device and of one or more locations captured by the monitoring device.

Other aspects will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of embodiments described in the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments described in the present disclosure may best be understood by reference to the following description taken in conjunction with the accompanying drawings in which:

FIG. 1A illustrates a variety of situations in which a system for segmenting a period of time into identification of locations of a user performing activities is used, in accordance with one embodiment described in the present disclosure.

FIG. 1B is a diagram of a method for determining an amount of a type of movement of a monitoring device over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 1C is a diagram of a method for determining an amount of another type movement of a monitoring device over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 1D is a diagram of a method for determining an amount of yet another type movement of a monitoring device over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 1E is a diagram of a method for determining an amount of another type movement of a monitoring device over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 2A is a diagram of a system for transferring data between a monitoring device and a server via a computing device and a network, in accordance with one embodiment described in the present disclosure.

FIG. 2B is a diagram of an embodiment of a system for transferring data between a monitoring device and the server via a mobile computing device and the network, in accordance with one embodiment described in the present disclosure.

FIG. 3A is a diagram of a system to illustrate components of a monitoring device, in accordance with one embodiment described in the present disclosure.

FIG. 3B is a diagram of a system to illustrate components of another monitoring device, in accordance with one embodiment described in the present disclosure.

FIG. 4A is an isometric view of a monitoring device that is worn around a hand of a user or around a leg of the user, in accordance with one embodiment described in the present disclosure.

FIG. 4B is an isometric view of another monitoring device that fits to an article of clothing or a belt worn by a user, in accordance with one embodiment described in the present disclosure.

FIG. 4C is a view of yet another monitoring device that fits to an article of clothing or a belt worn by a user, in accordance with one embodiment described in the present disclosure.

FIG. 4D is an isometric view of another monitoring device that fits to an arm of a user, in accordance with one embodiment described in the present disclosure.

FIG. 5 is a block diagram of a computing device, in accordance with one embodiment described in the present disclosure.

FIG. 6A is a flowchart of a method for segmenting a period of time into identification of locations of a user performing activities, in accordance with one embodiment described in the present disclosure.

FIG. 6B is a flowchart of another method for segmenting a period of time into identification of locations of a user performing activities, in accordance with one embodiment described in the present disclosure.

FIG. 6C is a flowchart of yet another method for segmenting a period of time into identification of locations of a user performing activities, in accordance with one embodiment described in the present disclosure.

FIG. 6D is a flowchart of a method for segmenting a period of time into identification of locations of a user performing activities, in accordance with one embodiment described in the present disclosure.

FIG. 6E is a flowchart of another method for segmenting a period of time into identification of locations of a user performing activities, in accordance with one embodiment described in the present disclosure.

FIG. 6F is a flowchart of a method for combining a map with event data, in accordance with one embodiment described in the present disclosure.

FIG. 7A is a graphical user interface (GUI) that displays one or more events and that is generated by executing the method of FIG. 6A, 6B, 6C, 6E, or 6F, in accordance with one embodiment described in the present disclosure.

FIG. 7B is a diagram of another GUI that displays one or more events and that is generated by executing the method of FIG. 6A, 6B, 6C, 6E, or 6F in accordance with one embodiment described in the present disclosure.

FIG. 7C is a diagram illustrating a method for establishing boundaries between two locations arrived at by a user over one or more periods of time, in accordance with one embodiment described in the present disclosure.

FIG. 7D is a diagram of a GUI to illustrate a method of allowing a user to choose a location in case of common geo-locations between multiple locations, in accordance with one embodiment described in the present disclosure.

FIG. 7E is a diagram of a web page that includes a GUI that displays one or more events and that is generated by executing the method of FIG. 6A, 6B, 6C, 6E, or 6F, in accordance with one embodiment described in the present disclosure.

FIG. 7F-1 is a GUI to illustrate activity levels of one or activities performed by a user over a period of time and to illustrate activity levels associated with one or more locations at which the activities are performed, in accordance with one embodiment described in the present disclosure.

FIG. 7F-2 is a zoom-in of the GUI of FIG. 7F-1, in accordance with one embodiment described in the present disclosure.

FIG. 7G-1 is a diagram of a first portion of a daily journal GUI that includes one or more GUIs that include event data for periods of time, in accordance with one embodiment described in the present disclosure.

FIG. 7G-2 is a diagram of a second portion of the daily journal GUI, in accordance with one embodiment described in the present disclosure.

FIG. 7G-3 is a diagram of a third portion of the daily journal GUI, in accordance with one embodiment described in the present disclosure.

FIG. 7H is a diagram of another daily journal GUI that includes one or more GUIs that include event data for periods of time, in accordance with one embodiment described in the present disclosure.

FIG. 7I is a GUI that provides an overview of one or more levels of one or more activities performed by a user at one or more locations over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 7J is a diagram of a GUI that includes a detailed view of activities displayed in the GUI of FIG. 7I, in accordance with one embodiment described in the present disclosure.

FIG. 7K is a diagram of a GUI that includes a more detailed view of activities displayed in the GUI of FIG. 7J, in accordance with one embodiment described in the present disclosure.

FIG. 7L is a diagram illustrating a method of combining activity levels over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 7M is a diagram of a GUI that describes an aggregate level of one or more activities performed by a user over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 7N is a diagram of a pie-chart of locations at which a user performs one or more activities and of percentages of activity levels at one or more locations over a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 7O is a diagram of a GUI that includes an overlay of a map on one or more locations that a user visits during a period of time to perform one or more activities performed by the user during a period of time, in accordance with one embodiment described in the present disclosure.

FIG. 7P is a diagram of a web page that illustrates that a map is overlaid on an event region to indicate a geo-location of a user at a time within a time period in which the user performs one or more activities, in accordance with one embodiment described in the present disclosure.

FIG. 7Q is a diagram of a GUI that includes a map below an event region, in accordance with one embodiment described in the present disclosure.

FIG. 7R is a diagram of a web page that is used to illustrate an overlay of event data on a map, in accordance with one embodiment described in the present disclosure.

FIG. 7S is a diagram of a web page that is used to illustrate a zoom-in of a portion of the map of FIG. 7R and of activity data of an activity performed by a user while the user is at the portion, in accordance with one embodiment described in the present disclosure.

FIG. 7T is a diagram of an embodiment of a web page that includes a GUI that further includes an overlay of a map on a user's path, in accordance with one embodiment described in the present disclosure.

FIG. 7U is a diagram of an embodiment of the web page of FIG. 7T to illustrate a zoom-in of a portion of the map of FIG. 7T and to illustrate activity data associated with the zoom-in, in accordance with one embodiment described in the present disclosure.

FIG. 7V is a diagram of an embodiment of a GUI that includes further details regarding the user's path of FIG. 7T, in accordance with one embodiment described in the present disclosure.

FIG. 8 is a diagram of one or more location identifiers and one or more activity identifiers, in accordance with one embodiment described in the present disclosure.

FIG. 9 is a diagram of a GUI that includes a relation between location/activity identifiers and activity levels of one or more activities performed by a user, in accordance with one embodiment described in the present disclosure.

FIG. 10 is a flowchart of a method for displaying an action identifier in a GUI, in accordance with one embodiment described in the present disclosure.

FIG. 11 is a flowchart of a method for displaying a location identifier in a GUI, in accordance with one embodiment described in the present disclosure.

DETAILED DESCRIPTION

Embodiments described in the present disclosure provide systems, apparatus, computer readable media, and methods for analyzing tracked activity data and segmenting/associating the activity data to contextually identifiable locations where a user, wearing an activity tracker performed such activities. This segmentation provides a way of identifying events that associate the identified activities to particular locations.

In one embodiment, the term location refers to a geographic position. The geographic position can be identified on a map, identified on a coordinate identifier using global positioning data (e.g., GPS), identified using radio signal tower locator data (e.g., cell towers), identified using wireless internet router signal data (e.g., Wi-Fi signals), identified using router signal data for multi-floor identification (e.g., floor-to-floor locator data), or combinations thereof. In some embodiments, changes in location data include determining a difference between location identified data at various times (e.g., every minute, every few minutes, every half hour, every hour, at particular hour intervals or days). In some embodiments, the time at which location data is obtained can vary depending on sensed activity. For example, if less activity or motion is detected, fewer location data points need be taken.

In some embodiments, a graphical user interface (GUI) is described. The GUI includes activity levels of activities performed by a user. The GUI can include a location identifier identifying a location at which an activity is performed and an activity identifier that identifies the activity. In one example, the activity identifier is overlaid on an area of the GUI that represents an activity performed by a user and the location identifier is overlaid on an area of the GUI that represents a location of the user who performed the activity. A user views the GUI to determine an activity level of an activity performed by the user at a location. As used herein, an activity identifier and the location identifier should be broadly viewed as some content, which is visible and is added to some part of a display.

In one embodiment, logic, code, computer programs, or combinations thereof, execute processes to determine what activity was performed by the user wearing an activity tracker. The processing includes examination of the movements or patterns of movements, and comparing the movements to a database of movements and rules that identify one or more possible activities for the movements. Using the captured location data, the system can then narrow down the number of possible activities. For instance, as will be described below, inferences can be made based on where motions or patterns of motions are captured. If a swinging motion corresponds to a golf course location or area near a golf course, it can be inferred with good certainty that the activity was golfing.

In one embodiment, by analyzing the motions or patterns of motions tracked, and analyzing the location(s) where the motions or patterns of motions occurred, logic using a rules database can with more certainty identify an activity of the user. That activity can then be matched to an identifier. The identifier, as noted below, can be a symbol, activity symbol, a graphical icon, text, images, or content that can be added to a GUI. The identifier, when overlaid, means that the identifier is added to some part of the graphical user interface. Overlay may or may not include placing graphics over other graphics. Broadly speaking, an overlay occurs when the identifier is added or incorporated onto the GUI in some way that a user can visually see the identifier being associated with some activity that was tracked.

In some embodiments, a map is overlaid on an area of a GUI that represents an activity performed by a user at a location.

In some embodiments, a route is overlaid on a map. The route indicates locations traveled by a user in a time period and activities performed by the user at the locations.

In one embodiment, the data is collected from an activity tracker and then transferred to a computing device. In some embodiments, the computing device can include a portable device, such as a smart phone, an internet connected watch, a tablet, a laptop, a desktop, etc. The computing device can then transfer the collected activity data to a server that is connected to the internet for processing.

The server can include one or more servers, which define a cloud processing system. The cloud processing system includes logic, code, programs and/or software for processing the activity data to produce the identifiable events. The cloud processing system can provide a system for creating user accounts for users and their activity trackers. The user accounts enable users to view GUIs that render and display the events identified using the tracked activity data and the location data (e.g., geo-location data). Processing logic on the servers associated with the cloud processing system can process the tracked data, can access other Internet services (e.g., mapping services, social networking services, location context services, etc., to enable formulation or identification of a location for particular activities, which define an event). Broadly speaking, an event is defined to include a location and an activity.

In one embodiment, the events can be displayed on a screen of a device, and a user is able to interactively view data concerning the events with contextual information, e.g., where certain events occurred.

In some embodiments, locations can be automatically identified by accessing mapping services and other online databases that identify locations. The online databases can include mapping programs, data from social networks, tagged data, crowd-sourced data, etc.

In some embodiments, the locations can be inferred or learned based on the activities and times of day, and/or repeat activities over a period of time (e.g., based on an identifiable pattern). Databases of rules are constructed and such rules are refined over time. The rules are used to enable the system to infer locations and provide appropriate contextual identification to the locations. In some embodiments, the rules can shape themselves using learning systems, and can be tailored for specific users. In still other embodiments, learned patterns and behaviors of other users can be used to collaboratively identify rules, shape rules or determine locations or identify locations. For instance, if multiple users tag a location as a coffee bar, this information can be used to associate "coffee bar" to some range of geo-location. If over time, the location starts to get tagged as a breakfast bar, the rules can be adjusted to now associate that geo-location as "breakfast bar." As businesses or location contexts change over time, so can the rules.

In various embodiments, the shape rules are used to associate one or more geo-locations with a location. For example, a shape, e.g., a circle, a polygon, an oval, a square, etc., is used to identify a location on a graphical user interface. The graphical user interface may include event data, a route, a map, or a combination thereof. A user changes a size via a user interface of a monitoring device or via an input device of a computing device of a shape to change a number of geo-locations associated with the location. For example, a user increases a size of a circle to include more geo-locations within a location that is identified by the circle. As another example, a user decreases a size of a polygon to exclude a number of geo-locations from within a location that is identified by the polygon. As another example, a center of a shape is changed to associate a different set of geo-locations with a location than that already associated with the location. For example, a user drags via a user interface of a monitoring device or via an input device of a computing device a point associated with, e.g., a center of, a vertex of, etc., a shape to a different spot on a graphical user interface. When the point is dragged, the shape is also dragged to the difference spot and is associated with a difference set of geo-locations than that before the movement of the center. The graphical user interface may include event data, a route, a map, or a combination thereof.

In another embodiment, the user may be allowed to post details of particular locations. The user can identify locations with particular custom identifiers, e.g., "mom's house" or can select from predefined identifiers. In still other embodiments, the user can be asked to identify a location. In still another embodiment, the user can be asked via custom queries, such as: "Are you at work?"; "Is this your home?"; "Are you driving?"; "Do you need medical assistance? if so, say or type help" etc. Or, the queries can be presented to the user at a later time, such as when the user is viewing his or her past activity on a GUI. In some embodiments, the queries can be provided via a cloud program, when accessing a computer with cloud access, via push notifications, via voice requests, etc. Based on this returned feedback, the servers and databases of the cloud service can learn or associate location identification to particular locations, which are later identified by detecting the geo-location of the tracker.

In some embodiments, a user tags a location as being associated with a person known to the user. For example, a user logs into his/her user account and tags a location as being Mom's house, Eric's house, Jessica's house, Buddy's gym, etc. Examples of a person known to the user include a friend of the user, a work mate of the user, a special interest of the user, a relative of the user, an acquaintance of the user, or a family member of the user. The user tags via an input device of a computing device or via a user interface of a monitoring device. A processor, e.g., a processor of the monitoring device, a processor of the computing device, a processor of a server, a processor of a virtual machine, or a combination thereof, etc., determines that the tag indicates that the user knows the person. For example, the term "Mom" indicates that the person is a mom of the user. As another example, "Eric" indicates that the person is a friend, a relative, or an acquaintance of the user. The processor determines whether the person tagged has a user account. The user account is used to display event data that includes activities performed by the person and/or locations visited by the person while performing the activities, etc. The processor suggests to the user to add the person to a social group, e.g. a friend group, a work mate group, a special interest group, a relative group, an acquaintance group, a family member group, etc. When the user adds the person within the social group, the user account of the user indicates the addition of the person within the social group.

In general, the systems and methods facilitate determination of an activity level of an activity performed by a user at a location. For example, the systems and methods can determine that the user is sedentary for a particular period of time when the user is at work. As another example, the systems and methods can determine that the user is active when the user is at home. The activity or lack of activity is therefore contextually associated to a particular location. The location can be an address, map, or a combination of maps, addresses, activities, and/or predefined location identifiers or activities that occur at particular locations (e.g., golf occurs at a golf course, swimming occurs at a swimming pool, etc.). By providing the user location context to activities, the user is able to better view his or her actual activity performance and better health decisions can be made regarding and/or adjustments can be made in lifestyle.

In some instances, well known process operations have not been described in detail in order not to unnecessarily obscure various embodiments described in the present disclosure.

FIG. **1**A illustrates a variety of situations/activities in which a system and/or method uses location data to segment a period of time into identifiable events, each event defining an activity for a period of time. In one embodiment, location data is obtained for a time when the activity is tracked, such as location data and/or characteristics of the activity used to identify an event. As noted in detail below, a period of time having associated tracking data can be segmented into one or more events.

In the example of FIG. **1**A, a user **112**A wears a monitoring device **114**A on his arm while playing a sport, e.g., tennis. Other examples of a sport include badminton, golf, running, bicycling, vehicle racing, racquetball, squash, soccer, etc. It should be understood that the example of sports is provided, as such sports have particular identifiable activity patterns. However, any activity, whether sports related or not, can be tracked and associated to an event. For instance, another user **112**B wears a monitoring device **114**B on her arm while walking. Yet another user **112**C wears a monitoring device **114**C on his/her arm while doing yoga. Another user **112**D wears a monitoring device **114**D on his/her arm during sleep. Another user **112**E wears a monitoring device **114**E on his/her arm while playing golf. Yet another user **112**F wears a monitoring device **114**F on his/her clothing part while riding a bicycle. Another user **112**G wears a monitoring device **114**G on his/her foot while walking a user **112**H, e.g., a dog. In some embodiments, the user **112**G walks other animals, e.g., a tiger, a cat, etc. The user **112**H also wears a monitoring device **114**H on its arm. Another user **112**I wears a monitoring device **114**I on his arm during running.

In some embodiments, a user performs one or more of other activities, e.g., swimming, resistance training, rock climbing, skiing, snowboarding, hiking, skating, rollerblading, etc. It is noted that the activities described herein are not limiting and that other activities may be used.

It should be noted that in some embodiments, a user can wear, hold, append, strap-on, move, transport or carry a monitoring device while performing any type of activity, e.g., playing ping-pong, climbing stairs, descending stairs, hiking, sitting, resting, working, etc. Additionally, one user can be associated with more than one monitoring device, and such data can be processed and associated to the user's activity. In some embodiments, the data is selected from various devices of the user based on a priority algorithm. In some embodiments, data from more than one device can be blended or alternated together to define a more complete map of the activities.

Each monitoring device **114**A, **114**B, **114**C, **114**D, **114**E, **114**F, **114**G, **114**H, and **114**I communicates with a network **176**. In some embodiments, each monitoring device **114**A, **114**B, **114**C, **114**D, **114**E, **114**F, **114**G, **114**H, and **114**I communicates with the network **176** via a computing device, e.g., a desktop computer, a laptop computer, a smart phone, a tablet, a smart watch, a smart television, etc.

Examples of the network **176** include the Internet and an Intranet. The network **176** may be a wide area network, a local area network, or a combination thereof. The network **176** may be coupled to one or more servers, one or more virtual machines, or a combination thereof.

A server, a virtual machine, a controller of a monitoring device, or a controller of a computing device is sometimes referred to herein as a computing resource. Examples of a controller include a processor and a memory device.

As used herein, a processor includes an application specific integrated circuit (ASIC), a programmable logic device (PLD), a processor, a central processing unit (CPU), or a combination thereof, etc. Examples of a memory device include a random access memory (RAM) and a read-only memory (ROM). A memory device may be a Flash memory, a redundant array of disks (RAID), a hard disk, or a combination thereof.

A computing resource performs data capture, which is reception of activity data from a monitoring device. Examples of activity data include, without limitation, calories burned by a user, blood pressure of the user, heart rate of the user, weight gained by a user, weight lost by a user, stairs ascended, e.g., climbed, etc., by a user, stairs descended by a user, steps taken by a user during walking or running, floors descended by a user, floors climbed by a user, a number of rotations of a bicycle pedal rotated by a user, sedentary activity data, a distance covered by a user during walking, running, or driving a vehicle, a number of golf swings taken by a user, a number of forehands of a sport played by a user, a number of backhands of a sport played by a user, or a combination thereof. In some embodiments, sedentary activity data is referred to herein as inactive activity data or as passive activity data. In some embodiments, when a user is not sedentary and is not sleeping, the user is active.

The data capture also includes capturing a geo-location of a monitoring device. For example, geographical location data **120**A of the monitoring device **114**A is determined by the monitoring device **114**A and obtained by a computing resource. A geo-location is determined by a device locator, which is further described below. Examples of a geo-location include latitude, radius, longitude, altitude, landmark, city, country, state, county, village, eatery, commercial place, commercial building, province, public place, or a combination thereof. In some embodiments, the geo-location data is obtained not by the monitoring device, but by a companion device (e.g., such as a smart phone or other portable device with global positioning system (GPS) data collection capabilities).

In various embodiments, a device locator obtains a speed of a monitoring device or of a computing device. For example, a device locator of a computing device determines a speed of the computing device and a device locator of a monitoring device determines a speed of the monitoring device. In various embodiments, a device locator of a device, e.g., a monitoring device, a computing device, etc., obtains an orientation of the device. In various embodiments, an orientation of a device includes a degree of rotation of the device with respect to an x axis, a y axis, and a z axis.

Similarly, geographical location data **120**B of the monitoring device **114**B is determined by the monitoring device **114**B and obtained by a computing resource, geographical location data **120**C of the monitoring device **114**C is determined by the monitoring device **114**C and obtained by a computing resource, geographical location data **120**D of the monitoring device **114**D is determined by the monitoring device **114**D and obtained by a computing resource, geographical location data **120**E of the monitoring device **114**E is determined by the monitoring device **114**E and obtained by a computing resource, geographical location data **120**F of the monitoring device **114**F is determined by the monitoring device **114**F and obtained by a computing resource, geographical location data **120**G of the monitoring device **114**G is determined by the monitoring device **114**G and obtained by a computing resource, geographical location data **120**H of the monitoring device **114**H is determined by the monitoring device **114**H and obtained by a computing resource, and geographical location data **120**I of the monitoring device **114**I is determined by the monitoring device **114**I and obtained by a computing resource.

A geo-location of a monitoring device is used in conjunction with activity data by a computing resource to perform data analysis. The data analysis is performed by a processor. For example, a level, e.g., an amount, etc., of an activity performed by a user at a geo-location is determined. Examples of activity level include a number of calories burned by a user, an amount of weight gained by a user, a heart rate of a user, an amount of blood pressure of a user, an amount of weight lost by a user, a number of stairs ascended by a user, a number of stairs descended by a user, a number of steps taken by a user during walking or running, a number of floors descended by a user, a number of floors climbed by a user, a number of rotations of a bicycle pedal rotated by a user, a distance covered by a vehicle operated by a user, a number of golf swings taken by a user, a number of forehands of a sport played by a user, a number of backhands of a sport played by a user, or a combination thereof, etc. The geo-location and the activity level are combined and displayed to a user to monitor activity and/or health of the user over a period of time. As another example, a geo-location is combined with an activity level to determine whether a user is still at a location, e.g., a house, a work place, an office, a gym, a sandwich shop, a coffee shop, etc. after performing the activity or has left the location after performing the activity. In this example, when it is determined that the user is at the location and the activity level has crossed from a first side of a threshold to a second side of the threshold, it is determined that the user has left the location. Moreover, in this example, when it is determined that the user is at the location and that the activity level has not crossed from the first side to the second side, it is determined that the user is still at the location. In some embodiments, the first side of the threshold is below the threshold and the second side of the threshold is above the threshold. In various embodiments, the first side of the threshold is above the threshold and the second side is below the threshold.

In some embodiments, a user indicates to a monitoring device or a computing device that the user has exited or entered a location. For example, the user logs into a user account and indicates via a user interface of a monitoring device or an input device of a computing device that the user is exiting or entering a location. A processor, e.g., a processor of a server, a processor of a virtual machine, a processor of the computing device, or a processor of the monitoring device, or a combination thereof, etc., receives the indication from the user. The processor determines a time at which the user indicates that the user is entering or exiting the location and indicates the time on a graphical user interface that includes event data. In various embodiments, upon determining that the user has entered a location, the processor accesses the activity-location database to determine one or more activities that may be performed by the user at the location and generates one or more activity identifiers of the activities.

In some embodiments, a computing resource performs data synchronization, which includes synchronization of activity data received from various users and synchronization of geo-locations of the users. For example, activity data from one user is displayed to another user when both the users are within one location. As another example, activity data of one user is displayed to another user when both users are performing the same activity, e.g., walking, running, etc. As yet another example, activity data of one user is displayed to another user when both users are performing the same activity at the same location. As another example, activity data is displayed to two or more users who perform similar activities in disparate locations (e.g., a virtually shared walk).

In various embodiments, a computing resource recommends data to a user based on activity data received from a monitoring device used by the user and based on a location of the user. For example, when it is determined that a user is at a golf course and has not taken a number of golf swings, the recommendation data indicates to the user that the user may take an additional amount of golf swings to achieve a goal. As another example, when it is determined that a user is not going to (or is unlikely to based on knowledge of the user's historical activity patterns) reach his/her activity goal, e.g., walking a number of steps over a time period, running a distance over a time period, climbing or descending a number of stairs over a time period, bicycling for an amount of distance over a time period, bicycling for a number of pedal rotations of a bicycle over a time period, lifting a weight for a number of times over a time period, hitting a forehand for a number of times over a time period, hitting a backhand for a number of times over a time period, etc., and it is determined that the user is at a location, the computing resource generates the recommendation data to indicate to the user to perform an activity or to extend performing the activity at the location or at another location that is within a distance of the location. These recommendations can be provided as electronic notifications to the user's device, the user's smart phone, to the tracking device, or some other user interface. The recommendations can also be provided as voice notifications, in case the user is occupied in a task that limits viewing a screen, such as driving. The determination that the user is driving can be made using data regarding the speed/motion of the device, location data (e.g., in a car), etc.

In some embodiments, a user may stand on a monitoring device that determines a physiological parameter of the user. For example, a user stands on a scale that measures a weight, a body fat percentage, a biomass index, or a combination thereof, of the user.

FIG. **1**B is a diagram of an embodiment of a method for determining an amount of movement **116**A of the monitoring device **114**G, e.g., a number of stairs ascended by the monitoring device **114**G, etc., over a period of time t**1**. The amount of movement **116**A occurs when the user **112**A is performing an activity of climbing stairs over the time period t**1**. A method of determining an amount of movement is performed by a position sensor of a monitoring device. Additionally, the method can simultaneously identify a location for the activity. The monitoring device **114**G may be worn on the leg or foot (as depicted in FIG. **1**B), or elsewhere on the body such as the wrist, forearm, upper arm, head, chest, or waist, or as an article of clothing such as a shirt, hat, pants, blouse, glasses, and the like.

A position sensor determines an amount of linear or angular movement of an arm of a user or of another body part of a user. For example, a position sensor determines that the user **112**A wearing the monitoring device **114**G on his leg has climbed a number of stairs, e.g., four, twenty, forty, etc., between positions A and B over the time period t**1**.

In some embodiments, instead of a number of stairs ascended, a position sensor determines a number of stairs descended by the monitoring device **114**G.

FIG. **1**C is a diagram of an embodiment of a method for determining an amount of movement **116**B, e.g., an amount of distance traveled, a number of steps traveled, etc., of the monitoring device **114**E over a period of time t**2**. For example, a position sensor determines that the user **112**A wearing the monitoring device **114**E on his hand has walked or ran a number of steps, e.g., four, fifty, hundred, etc., between positions C and D over the time period t**2**. The amount of movement **116**B occurs when the user **112**A is performing an activity of walking or running over the time period t**2**.

FIG. **1**D is a diagram of an embodiment of a method for determining an amount of movement **116**C, e.g., an amount angular movement, etc., of the monitoring device **114**E over a period of time t**3**. For example, a position sensor determines that a hand of the user **112**A wearing the monitoring device **114**E on his/her hand is displaced by an angle over the time period t**3**. The amount of movement **116**C occurs when the user **112**A is performing a sports activity, e.g., golfing, playing tennis, playing ping-pong, resistance training, etc., over the time period t**3**.

In some embodiments, a position sensor measures an angular displacement of a leg of the user **112**A wearing the monitoring device **114**G on his leg.

In various embodiments, a position sensor infers an activity performed by a user over a period of time based on one or more positions of a monitoring device that has the position sensor and that is worn by the user. For example, upon determining that a difference between a first y position and a second y position within a xyz co-ordinate system is greater than an amount and that x positions between the two y positions indicate a curved movement, a position sensor of a monitoring device determines that the user **112**A is playing golf. As another example, upon determining that the user **112**A covers less than a distance along an x-axis over a period of time, a position sensor of a monitoring device worn by the user **112**A determines that the user **112**A is walking and upon determining that the user **112**A covers more than the distance along the x-axis over the period of time, the position sensor determines that the user **112**A is running.

FIG. **1**E is a diagram of an embodiment of a method for determining an amount of movement **116**D, e.g., an amount angular movement, etc., of the monitoring device **114**E over a period of time t**4**. For example, a position sensor determines that the user **112**A wearing the monitoring device **114**E on his/her hand is displaced by an angle over the time period t**4**. The amount of movement **116**D occurs when the user **112**A is performing an activity, e.g., a sports activity, an exercise activity, etc., over the time period t**4**.

Examples of a period of time include a portion of a day, or a day, or a portion of a month, or a month, or a portion of a year, or a year, or a portion of a number of years, or a number of years.

FIG. **2**A is a diagram of an embodiment of a system **250** for transferring data, e.g., activity data, geo-location data, etc., between the monitoring device **114**E and a server **228** via a computing device **164**A and the network **176**. A wireless link **168** establishes a connection between the monitoring device **114**E and the computing device **164**A. For example, a Bluetooth device located within the monitoring device **114**E establishes a Bluetooth connection with a Bluetooth dongle interfacing with the computing device **164**A via a Universal Serial Bus (USB) interface. As another example, an ad hoc Wi-Fi transmission and reception is established between a Wi-Fi adapter of the monitoring device **114**E and a Wi-Fi adapter of the computing device **164**A. The wireless link **168** may be a Bluetooth or a Wi-Fi connection. A connection between the monitoring device **114**E and the computing device **164**A is used to transfer data between the monitoring device **114**E and the computing device **164**A.

In some embodiments, a geo-location and/or a position determined by the monitoring device **114**E is sent from the monitoring device **114**E via the computing device **164**A to a server or a virtual machine for processing, e.g., analysis, determining event data, etc. The server or the virtual machine processes the geo-location and/or the position and sends processed data, e.g., event data, maps, routes, etc., to the computing device **164**A for display on the computing device **164**A.

In some embodiments, instead of the wireless link **168**, a wired connection is used between the monitoring device **114**E and the computing device **164**A.

Moreover, a wired connection **252** is established between the computing device **164**A and the server **228** via the network **176**. A wired connection includes network components, e.g., one or more routers, one or more switches, one or more hubs, one or more repeaters, one or more servers, one or more cables, or a combination thereof, etc.

The server **228** includes a processor **190**, a network interface controller (NIC) **254** and a memory device **256**. The processor **190** is coupled with the memory device **256** and the NIC **254**. An example of a NIC includes a network interface card. In some embodiments, a modem is used instead of a NIC.

The memory device **256** includes a user account **174** of the user **112**A. The user **112**A accesses the user account **174** when authentication information, e.g., username, password, fingerprints, footprints, thumbprints, or a combination thereof, etc., is authenticated by the processor **190** or another server of the network **176**. The authentication information is provided by the user **112**A via an input device, e.g., a mouse, a stylus, a keyboard, a keypad, a button, a touch screen, or a combination thereof, etc., of a monitoring device or of a computing device.

The user account **174** is accessed by the user **112**A to review graphical user interface (GUI) data **186** on a display device of the computing device **164**A or of the monitoring device **114**E. The GUI data **186** includes geo-location data, a map, location in the form of location/activity identifiers, activity data in the form of activity levels, and/or physiological parameter of the user **112**A. The activity data represents activities performed by the monitoring device **114**E. The processor **190** associates, e.g., links, establishes a relationship between, etc., geo-location data, location, activity data, and/or physiological parameter of the user **112**A with the user account **174** to allow access of the geo-location data, activity data, a map, location, and/or physiological parameter upon access of the user account **174**. This relationship provides context to the activity, both in terms of what the activity was and where the activity occurred. This context can be used to define events that occur over a period of time, and the events can be presented on a GUI of a device, to provide useful information to a user regarding his or her activity over that period of time. Not only is the user provide with activity data, but the activity data is displayed in a graphical or data organized manner that identifies segmented activity data and associates it to the proper or inferred context.

In some embodiments, instead of using the monitoring device **114**E to establish the wireless connection **168**, any other monitoring device, e.g. the monitoring device **114**A (FIG. **1**A) or a monitoring scale is used.

It should be noted that in several embodiments, data is transferred from a monitoring device via a computing device and the network **176** to a virtual machine instead of the server **228**.

In some embodiments, instead of the wired connection **252**, a combination of a wireless connection and a wired connection is established.

In various embodiments, the user account **174** is stored in a memory device of a computing device or on a memory device of a monitoring device. In these embodiments, processing of a geo-location and/or position is not done on the server **228** or a virtual machine to generate processed data, e.g., event data, location identifier, activity identifier, etc. but is done by a processor of the computing device and/or by a processor of a monitoring device to generate the processed data.

FIG. **2**B is a diagram of an embodiment of a system **260** for transferring data, e.g., activity data, geo-location data, etc., between the monitoring device **114**E and the server **228** via a mobile computing device **164**B and the network **176**. A wireless link **170** establishes a connection between the monitoring device **114**E and the mobile computing device **164**B. The wireless link **170** may be a Bluetooth connection, a Wi-Fi connection, a near field connection, a radio frequency connection, or an optical connection, etc. In some embodiments, instead of the wireless link **168**, a wired connection is used between the monitoring device **114**E and the mobile computing device **164**B. A connection is used to transfer data between the monitoring device **114**E and the mobile computing device **164**B.

Moreover, the server **228** and the mobile computing device **164**B are coupled with each other via a wireless connection **262**, e.g., a Wi-Fi connection, etc., the network **176**, and a connection **264**. The connection **264** between the server **228** and the network **176** may be a wired or a wireless connection.

FIG. **3**A is a diagram of an embodiment of a system **270** to illustrate components of a monitoring device **108**A. The system **270** includes the monitoring device **108**A, a computing device **166**, the network **176**, and the server **228**.

The monitoring device **108**A is an example of any of the monitoring devices **114**A, **114**B, **114**C, **114**D, **114**E, **114**F, **114**G, **114**H, and **114**I (FIG. **1**A). The monitoring device **108**A includes an environmental sensor **272**, a position sensor **220**, a time measurement device **232**, a user interface **274**, a device locator **222**, a display device **276**, a processor **234**, a wireless communication device **278**, and a memory device **280**, all of which are coupled with each other.

Examples of the device locator **222** include a GPS transceiver, a mobile transceiver, etc. As used herein, a device locator may be referred to as a device or circuit or logic that can generate geo-location data. The geo-location data provides the appropriate coordinate location of the device or tracker, such as a location on a map or location in a room or building. In some embodiments, a GPS device provides the geo-location data. In other embodiments, the geo-location data can be obtained from various devices (e.g., cell towers, Wi-Fi device signals, other radio signals, etc., which can provide data points usable to locate or triangulate a location.

Examples of the environmental sensor **272** include a barometric pressure sensor, a weather condition sensor, a light exposure sensor, a noise exposure sensor, a radiation exposure sensor, and a magnetic field sensor. Examples of a weather condition include a temperature, humidity, a pollen count, air quality, rain conditions, snow conditions, wind speed, a combination thereof, etc. Examples of light exposure include ambient light exposure, ultraviolet (UV) light exposure, or a combination thereof, etc. Examples of air quality include particulate counts for varying sized particles, or level of carbon dioxide in air, or level of carbon monoxide in air, or level of methane in air, or level of other volatile organic compounds in air, or a combination thereof.

Examples of the position sensor **220** include an accelerometer, a gyroscope, a rotary encoder, a displacement sensor, a calorie measurement sensor, a heat measurement sensor, a moisture measurement sensor, an ultrasonic sensor, a pedometer, an altimeter, a linear position sensor, an angular position sensor, a multi-axis position sensor, or a combination thereof, etc. In some embodiments, the position sensor **220** measures a displacement, e.g., angular displacement, linear displacement, a combination thereof, etc., of the monitoring device **108**A over a period of time with reference to an xyz co-ordinate system to determine an amount of activity performed by the user **112**A during the period of time. In some embodiments, a position sensor includes a biological sensor, which is further described below. The monitoring device **108**A is worn by the user **112**A to allow the position sensor **222** to capture, e.g., obtain, etc., positions used to determine an activity performed within a location used by the user **112**A. In various embodiments, a position sensor includes a motion sensor.

Examples of the time measurement device **232** include a watch, an oscillator, a clock, an atomic clock, etc. Examples of the user interface **274** include an input device for interacting with the user **112**A. For example, the user interface **274** receives a selection of the GUI data **186** (FIG. **2**A) from the user **112**A. It should be noted that when the user interface **274** includes a touch screen, the touch screen **274** is integrated within the display device **276**.

Examples of a display device includes a liquid crystal display (LCD) device, a light emitting diode (LED) display device, a plasma display device, etc. As an example, the display device **276** displays the GUI data **186**. In some embodiments, all GUIs described herein are displayed by rendering the GUI data **186**.

Examples of the memory device **280** are provided above. Examples of the wireless communication device **278** include a Wi-Fi adapter, a Bluetooth device, etc.

In some embodiments, the processor **234** receives one or more geo-locations measured by the device locator **222** over a period of time and determines a location of the monitoring device **108**A based on the geo-locations and/or based on one or more selections made by the user **112**A via the user interface **274** and/or based on information available within a geo-location-location database of the network **176**. For example, the processor **234** determines that a location within the geo-location-location database corresponds to one or more geo-locations stored within the geo-location-location database. In this example, upon receiving the geo-locations from the device locator **222**, the processor **234** determines the location based on the correspondence between the geo-locations and the location in the geo-location-location database. In some embodiments, the geo-location-location database includes a map of a geographical region, e.g., a city, a state, a county, a country, a continent, a geographical area, world, etc. The map is generated by the server **228** or another server based on one or more geo-locations.

The environmental sensor **272** senses and determines an environmental parameter, e.g., a barometric pressure, a weather condition, an amount of light exposure, an amount of noise, an amount of radiation, an amount of magnetic field, or a combination thereof, etc., of an environment in which the monitoring device **108**A is placed. The device locator **222** determines a geo-location of the monitoring device **108**A.

The time measurement device **232** determines an amount of time associated with one or more positions sensed by the position sensor **220**, associated with one or more environmental parameters determined by the environmental sensor **272**, associated with one or more geo-locations determined by the device locator **222**, and/or associated with one or more locations determined by the processor **234**. For example, the time measurement device **232** determines an amount of time for a number of positions that is reached by movement of the monitoring device **108**A and that is determined by the position sensor **220**. As another example, the time measurement device **232** determines an amount of time for a number of geo-locations reached by movement of the monitoring device **108**A and that is determined by the device locator **222**.

The wireless communication device **278** establishes a wireless link with the computing device **166** to send data, e.g., activity data, geo-location data, location data, a combination thereof, etc., to and/or receive the data and/or instructions from the computing device **166**. Each computing device **164**A and **164**B (FIGS. **2**A & **2**B) is an example of the computing device **166**. The instructions from the computing device **166** may be to send data, e.g., activity data, geo-location data, location data, a combination thereof, etc., to the computing device **166**.

In some embodiments, the monitoring device **108**A excludes the wireless communication device **278**. In these embodiments, the monitoring device **108**A communicates using a wired connection with the computing device **166**.

In various embodiments, the time measurement device **232** is integrated as a part of the position sensor **220** and/or as a part of the environmental sensor **272** and/or as a part of the device locator **222**.

In several embodiments, the monitoring device **108**A excludes the environmental sensor **272**.

In a number of embodiments, the monitoring device **108**A includes a biological sensor coupled to the environmental sensor **272**, the position sensor **220**, the time measurement device **232**, the user interface **274**, the device locator **222**, the display device **276**, the processor **234**, the wireless communication device **278**, and the memory device **280**. The biological sensor is further described below.

FIG. **3**B is a diagram of an embodiment of a system **290** to illustrate components of a monitoring device **108**B. The system **290** includes the monitoring device **108**B, the computing device **166**, the network **176**, and the server **228**. An example of the monitoring device **108**B includes a scale. The monitoring device **108**B is placed on a floor and the user **112**A stands on the monitoring device **108**B. The monitoring device **108**B includes an environmental sensor **292**, a biological sensor **294**, a time measurement device **295**, a user interface **296**, a device locator **306**, a display device **304**, a processor **302**, a wireless communication device **300**, and a memory device **298**.

The environmental sensor **292** performs the same functions as that of the environmental sensor **272** (FIG. **3**A) except that the environmental sensor **292** is of a different, e.g., larger, smaller, etc., size compared to a size of the environmental sensor **272**. In some embodiments, the environmental sensor **272** is used in the monitoring device **108**B instead of the environmental sensor **292**.

The biological sensor **294** senses and determines a physiological parameter of the user **112**A. For example, the biological sensor **294** determines a weight of the user **112**A. As another example, the biological sensor **294** determines a body mass index of the user **112**A. As yet another example, the biological sensor **294** determines a fingerprint or a footprint of the user **112**A. As another example, the biological sensor **294** determines a heart rate, a hydration level, a body fat, a bone density, and/or a bioimpedance of the user **112**A. Examples of the biological sensor **294** include a biometric sensor, a physiological parameter sensor, or a combination thereof.

The time measurement device **295** performs the same functions as that of the time measurement device **232** (FIG. **3**A) except that the time measurement device **295** is different, e.g., larger, smaller, etc., in size compared to the time measurement device **232**. As an example, the time measurement device **295** determines an amount of time for a number of physiological parameters measured by the biological sensor **294**.

In some embodiments, the time measurement device **232** is used in the monitoring device **108**B instead of the time measurement device **295**.

Similarly, the user interface **296** performs the same functions as that of the user interface **274** (FIG. **3**A) and is of a different size than that of the user interface **274**. In various embodiments, the user interface **274** is used in the monitoring device **108**B instead of the user interface **296**.

Moreover, the memory device **298** performs the same functions as that of the memory device **280** (FIG. **3**A) and is of a different size than that of the memory device **280**. For example, the memory device **298** includes a different, e.g., larger, smaller, etc., number of memory cells compared to memory cells of the memory device **280**. In various embodiments, the memory device **280** is used in the monitoring device **108**B instead of the memory device **298**.

Also, the wireless communication device **300** performs the same functions as that of the wireless communication device **278** (FIG. **3**A) and is of a different size than that of the wireless communication device **278**. For example, the wireless communication device **300** includes electrical components that allow a transfer data at a different, e.g., higher, lower, etc., rate with the computing device **166** compared to a rate of transfer of data between the wireless communication device **278** and the computing device **166**. In various embodiments, the wireless communication device **278** is used in the monitoring device **108**B instead of the wireless communication device **300**.

Furthermore, the processor **302** performs the same functions as that of the processor **234** (FIG. **3**A) and is of a different, e.g., larger, smaller, etc., size than that of the processor **234**. For example, the processor **302** is of a size to achieve a different, e.g., higher, lower, etc., speed than that of the processor **234**. In various embodiments, the processor **234** is used in the monitoring device **108**B instead of the processor **302**.

Moreover, the display device **304** performs the same functions as that of the display device **276** (FIG. **3**A) and is of a different, e.g., larger, smaller, etc., size than that of the display device **276**. In various embodiments, the display device **276** is used in the monitoring device **108**B instead of the display device **304**.

Also, the device locator **306** performs the same functions as that of the device locator **222** (FIG. **3**A) and is of a different, e.g., larger, smaller, etc., size than that of the device locator **222**. In various embodiments, the device locator **222** is used in the monitoring device **108**B instead of the device locator **306**.

In some embodiments, the monitoring device **108**B includes a position sensor (not shown) that performs the same functions as that of the position sensor **220** (FIG. **3**A). The position sensor of the monitoring device **108**B is coupled to the environmental sensor **292**, the biological sensor **294**, the time measurement device **295**, the user interface **296**, the device locator **306**, the display device **304**, the processor **302**, the wireless communication device **300**, and the memory device **298**. In various embodiments, the position sensor **220** is implemented within the monitoring device **108**B.

FIG. **4**A is an isometric view of an embodiment of a monitoring device **110**A that is worn around a hand of a user or around a leg of the user. For example, the monitoring device **110**A has a band that is unclasped to allow the monitoring device **110**A to extend around a wrist of a user or a leg of the user. After the monitoring device **110**A extends around the wrist, the band is clasped to fit the monitoring device **110**A to the wrist of the user or to the leg of the user. As another example, the monitoring device **110**A has an elastic band that is stretched to allow a grip of the monitoring device **110**A to expand. The monitoring device **110**A is then slipped around a palm of a user to a wrist of the user or is slipped around a foot of the user to an ankle of the user. The elastic band is then released to fit the monitoring device **110**A to the wrist of the user or the ankle of the user. In some embodiments, the monitoring device **110**A is worn on a forearm or an upper arm of a user. In other embodiments, the monitoring device can be carried, held, stored in a bag, attached to a shoe, attached to a shirt or pants, etc. In other embodiments, a single person can hold or wear multiple devices. The multiple devices can track the same body part or object or can track/monitor multiple body parts, or objects. For instance, the user can wear one on his/her wrist, one in a shoe, one on his pants, a hat, a visor, or any other object that can track some movement and/or location of the user.

The monitoring device **110**A includes a display screen **320** of a display device that displays activity data of one or more activities performed by a user over a period of time, chronological data, geo-location data, or a combination thereof. Examples of a display screen include an LCD screen, an LED screen, a plasma screen, etc. Examples of chronological data include a time of day, a day, a month, a year, etc. The monitoring device **110**A is an example of any of the monitoring devices **114**A, **114**B, **114**C, **114**D, **114**E, **114**G, **114**H, **114**I (FIG. **1**A), and **108**A (FIG. **3**A).

The monitoring device **110**A includes one or more input devices that allows a user to switch between displaying different types of data, e.g., from activity data to chronological data, from chronological data to activity data, from one type of activity data to another type of activity data, from geo-location data to activity data, from activity data to geo-location data, etc., and to adjust or set chronological data. Types of activity data include calories burned by a user, weight gained by a user, weight lost by a user, stairs ascended by a user, stairs descended by a user, steps taken by a user during walking or running, floors descended by a user, floors climbed by a user, rotations of a bicycle pedal rotated by a user, distance covered by a vehicle operated by a user, golf swings taken by a user, forehands of a sport played by a user, backhands of a sport played by a user, or a combination thereof, etc.

Again, it should be noted that in some embodiments, the monitoring device **110**A is implemented as a watch, a wristband, or a bracelet, that is worn/held by the user **112**A.

FIG. **4**B is an isometric view of an embodiment of a monitoring device **110**B that fits to an article of clothing or a belt worn by a user. For example, the monitoring device **110**B has a pivoting clip that opens to allow the monitoring device **110**B to extend with respect to a pocket of a shirt worn by a user. After the monitoring device **110**B extends with respect to the pocket, the clip is retracted to fit the monitoring device **110**B to the pocket. The clip may be located between an upper portion **322** and a lower portion **324** of the monitoring device **110**B to allow the upper portion **322** to extend from and pivot with respect to the lower portion **324**.

The monitoring device **110**B includes a display screen **326** that displays activity data, chronological data, geo-location data, or a combination thereof. The monitoring device **110**B is an example of the monitoring device **108**A (FIG. **3**A). The monitoring device **110**B includes one or more input devices that allow a user to switch between displaying different types of data and to adjust or set chronological data.

FIG. **4**C is a view of an embodiment of a monitoring device **110**C that fits to an article of clothing or a belt worn by a user. For example, the monitoring device **110**C has a flexible pivoting clip that opens to allow the monitoring device **110**C to extend with respect to a pocket of a pant worn by a user. After the monitoring device **110**C extends around the pocket, the clip is retracted to fit the monitoring device **110**C to the pocket. The clip may be located between an upper portion **328** and a lower portion **330** of the monitoring device **110**C to allow the upper portion **328** to extend from and pivot with respect to the lower portion **330**.

The monitoring device **110**C includes a display screen **332** that displays data, e.g., activity data, chronological data, geo-location data, or a combination thereof, etc. The monitoring device **110**C is an example of the monitoring device **108**A (FIG. **3**A). The monitoring device **110**C includes one or more input devices that allow a user to switch between displaying different types of data and to adjust or set chronological data.

FIG. **4**D is an isometric view of an embodiment of a monitoring device **110**D that fits with respect to an arm of a user. For example, the monitoring device **110**D includes a hook and loop clasp that is extended to loop around a wrist of a user and is then retracted to hook to the wrist. In some embodiments, the monitoring device **110**D is implemented within a wrist watch. The monitoring device **110**D includes a number of buttons **334**A, **334**B, and **334**C to allow the monitoring device **110**D to switch between different types of data, e.g., geo-location data, location, chronological data, activity data, physiological parameter, etc., and to adjust or set chronological data.

The monitoring device **110**D includes a display screen **336** that displays activity data, chronological data, geo-location data, physiological parameter, location data, the GUI data **186** (FIG. **2**A), or a combination thereof. The monitoring device **110**D is an example of any of the monitoring devices **114**A, **114***b*, **114**C, **114**D, **114**E, **114**G, **114**H, **114**I (FIG. **1**A), and **108**A (FIG. **3**A).

It should be noted that in some embodiments, instead of being implemented as a watch, the monitoring device **110**D is implemented as a wristband or a bracelet that is worn by the user **112**A.

Monitoring devices have shapes and sizes adapted for coupling to, e.g., secured to, worn, etc., the body or clothing of a user. The monitoring devices collect one or more types of physiological and/or environmental data from embedded sensors and/or external devices and communicate or relay the data to other devices, including devices capable of serving as an Internet-accessible data sources, thus permitting the collected data to be viewed, for example, using a web browser or network-based application. For example, while the user **112**A is wearing or holding a monitoring device, the monitoring device may calculate and store the user's step count using one or more sensors. The monitoring device then transmits data representative of the user's step count to an account on a virtual machine, a computer, or a mobile phone, where the data may be stored, processed, and visualized by the user **112**A.

Indeed, the monitoring device may measure or calculate a plurality of activity data and/or physiological parameters in addition to, or in place of, the user's step count. These activity data and/or physiological parameters include, but are not limited to, energy expenditure, e.g., calorie burn, etc., floors climbed, floors descended, heart rate, heart rate variability, heart rate recovery, geo-location, elevation, speed and/or distance traveled, swimming lap count, swimming stroke type and count detected, bicycle distance and/or speed, blood pressure, blood glucose, skin conduction, skin temperature, body temperature, electromyography, electroencephalography, weight, body fat, caloric intake, nutritional intake from food, medication intake, sleep periods, sleep phases, sleep quality, pH levels, hydration levels, respiration rate, or a combination thereof. The monitoring device may also measure or calculate parameters related to an environment around the user **112**A, such as, e.g., barometric pressure, weather conditions (e.g., temperature, humidity, pollen count, air quality, rain/snow conditions, wind speed, etc.), light exposure (e.g., ambient light, UV light exposure, time and/or duration spent in darkness, etc.), noise exposure, radiation exposure, magnetic field, or a combination thereof.

In some embodiments, the monitoring device quantifies work productivity against noise levels and/or against air quality and/or against temperature and/or against pressure and/or against humidity and/or against pollen count and the quantification is identified as a level within event data. In several embodiments, the monitoring device quantifies stress levels against noise levels and/or against an amount of time spent by the user **112**A at work and/or against an amount of time spent by the user **112**A exercising outside a work location and/or against an amount of time spent by the user **112**A in a gym and/or an amount of time spent by the user **112**A at his parent's home, and the quantification is identified as a level within event data. In some embodiments, a stress level is quantified, e.g., measured, determined, etc., based on heart rate variability (HRV) and/or galvanic skin response (GSR). The HRV and/or the GSR are measured by a biological sensor.

Furthermore, a monitoring device or a computing device collating data streams may calculate parameters derived from the activity data and/or physiological parameters. For example, monitoring device or a computing device may calculate a user's stress and/or relaxation levels through a combination of heart rate variability, skin conduction, noise pollution, and sleep quality. In another example, a monitoring device or a computing device may determine an efficacy of a medical intervention (e.g., medication) through a combination of medication intake, sleep and/or activity data. In yet another example, the monitoring device or a computing device may determine an efficacy of an allergy medication through the combination of pollen data, medication intake, sleep and/or other activity data.

FIG. **5** is a block diagram of an embodiment of the computing device **166**. The computing device **166** includes a processor **226**, a memory device **338**, an input device **240**, an input/output interface (I/O) **342**, a device locator **344**, a wireless communication device **346**, an I/O **348**, a graphical processing unit (GPU) **350**, a display device **352**, an I/O **354**, a NIC **356**, and an I/O **358**, all of which are coupled to each other via a bus **360**.

An I/O is a parallel interface, a serial interface, or a USB interface between two devices that are coupled to the I/O. For example, the I/O **358** is an interface between the NIC **356** and the bus **360**.

Examples of the processor **226** and the memory device **338** are provided above. Moreover, examples of the input device **340** and the device locator **344** are provided above. Furthermore, examples of the wireless communication device **346**, the display device **352**, and the NIC **356** are provided above. The GPU **350** executes a rendering technique to display data, e.g., GUI, web page, etc., on the display device **352**.

The wireless communication device **346** receives geo-location data and activity data from the wireless communication device **278** (FIG. **3**A) of the monitoring device **108**A and/or the wireless communication device **300** (FIG. **3**B) of the monitoring device **108**B. The processor **226** determines a group of activity data and a location/activity identifier based on the activity data and the geo-location data.

In some embodiments, the computing device **166** includes a wired communication device in addition to or instead of the wireless communication device **300**. Examples of the wired communication device include a USB interface, a parallel interface, and a serial interface.

In several embodiments, the user **112**A provides via the user interface **274** (FIG. **3**A) of the monitoring device **108**A to the processor **234** or via the input device **340** (FIG. **5**) of the computing device **166** to the processor **226** one or more locations, e.g., a home of the user **112**A, coffee shop, work, gym, a home of a friend of the user **112**A, a home of a family member of the user **112**A, a work place of the user **112**A, a place, a street, a building, etc., that the user **112**A visits over a period of time. In some embodiments, the user **112**A provides via the user interface **274** (FIG. **3**A) of the monitoring device **108**A to the processor **234** or via the input device **340** (FIG. **5**) of the computing device **166** to the processor **226** a size of a location and a type of a location, e.g., work place, sandwich place, pizza place, eatery, gym, golf course, park, running place, walking place, eating place, etc. Examples of a size of a location include a number of floors within the location, a square footage of a location, a number of offices in the location, a number of rooms in the location, a number of people that can fit in the location, a height of the location, a width of the location, a length of the location, a radius of a circle that identifies the location, a diameter of a circle that identifies the location, or a combination thereof.

The one or more locations, the type of location, and/or the size of the location received from the user **112**A are sent by the monitoring device **108**A or by the monitoring device **108**B via the computing device **166** and the network **176** to the server **228** to be stored in the geo-location-location database. In some embodiments, the one or more locations, the type of location, and/or the size of the location received from the user **112**A are sent by the monitoring device **108**A or by the monitoring device **108**B via the network **176** to the server **228** without using the computing device **166** to be stored in the geo-location-location database.

In some embodiments, upon accessing the geo-location-location database, the processor **226** or the processor **234** determines that the geo-location-location database does not include a location corresponding to one or more geo-locations visited by the user **112**A over a period of time. The processor **226** determines whether the user **112**A is within a radius that includes one or more geo-locations of the user **112**A. Upon determining that the user **112**A is within the radius for more than a number of instances of time, the processor **226** generates a prompt to provide to the user **112**A via the display device **352** or the processor **234** generates the prompt to provide to the user **112**A via the display device **276**. The prompt requests the user **112**A to provide the location corresponding to the one or more geo-locations that are within the radius and that are visited by the user **112**A.

In a number of embodiments, the processor **234** determines that among multiple locations, a location within the geo-location-location database is closest to a geo-location of the user **112**A wearing a monitoring device, and determines the location to correspond to the geo-location-location of the user **112**A.

In some embodiments, the processor **234** receives a selection, e.g., an expansion of a bubble-shaped or another shaped graphical element or displayed on the display device **276**, a contraction of a bubble-shaped or another shaped graphical element displayed on the display device **276**, etc., from the user **112**A and the selection indicates that a location corresponds to a different set of geo-locations than that indicated by the geo-location-location database. Upon receiving the selection, the processor **234** determines that the location corresponds to the different set of geo-locations than that indicated by the geo-location-location database.

It should be noted that a graphical element has one or more graphical properties, e.g., a shape, a color, a shade, a texture, or a combination thereof. For example, a graphical element includes a block, a line, a box, a dot, a pin, a circle, a bubble, or a combination thereof. A graphical element may represent an activity, a location, an activity level, a route, a location identifier, an activity identifier, event data, a background, a timeline, a map, etc. In one embodiment, the graphical element is a symbol. The symbol is a graphic element, which has some text, or graphic, or text and graphic, or represents an icon. The symbol can also represent a link, which provide more data when selected.

FIG. **6**A is a flowchart of an embodiment of a method **102** for segmenting a period of time into identification of locations of a user performing activities. The method **102** is executed by the monitoring device **108**A (FIG. **3**A).

The method **102** includes detecting, in an operation **104**, an activity of the monitoring device **108**A when the monitoring device **108**A is worn by the user **112**A (FIG. **1**A). It should be noted that when the monitoring device **108**A is worn by the user **112**A, the activity of the monitoring device **108**A is the same as that of the user **112**A. The activity includes an amount of movement of the monitoring device **108**A and is performed for a period of time. In some embodiments, the activity includes a number of calories burned by the user **112**A. Examples of the activity of the user **112**A detected by the monitoring device **108**A include running, or walking, or jogging, or sleeping, or moving around, or a sports activity, or sleep, or a combination thereof.

The amount of movement of the user **112**A includes an amount of movement of a body part of the user **112**A. For example, the amount of movement of the user **112**A includes an amount of stairs ascended by the user **112**A, or an amount of stairs descended by the user **112**A, a number of forehands of a sport played by the user **112**A, or a number of backhands of the sport, or a number of serves of the sport made by the user **112**A, or a number of times a golf swing is made by the user **112**A, or a number of times a soccer ball is kicked by the user **112**A, or a number of times a ball is thrown by the user **112**A, a number of rotations of a bicycle made by the user **112**A, or a number of times a paddle, e.g., a brake pedal, an accelerator pedal, etc., of a vehicle is pushed by the user **112**A, or a number of times a hand movement is made by the user **112**A, or a number of times a leg movement is made by the user **112**A, or a number of times a steering wheel of a vehicle is rotated partially or fully by the user **112**A, or an amount of calories burned by the user **112**A, or an amount of distance traveled by the user **112**A, an amount of steps walked or ran by the user **112**A, or an amount of hours slept by the user **112**A, or an amount of time for which the user **112**A is active, or a combination thereof.

The detection of the activity is performed by the position sensor **220** (FIG. **3**A) of the monitoring device **108**A. For example, the position sensor **220** determines the amount of movement of the user **112**A. The position sensor **220** determines the amount of movement at each amount of time, e.g., second, minute, hour, a fraction of a second, a fraction of a minute, a fraction of an hour, etc., that is measured by the time measurement device **232** (FIG. **3**A) of the monitoring device **108**A.

The method **102** further includes obtaining, in an operation **118**, geo-location data for the monitoring device **108**A. For example, the geo-location data includes a latitude, an altitude, and/or a longitude of the monitoring device **108**A. The geo-location data is obtained by the device locator **222** (FIG. **3**A) of the monitoring device **108**A. For example, signals are sent between the device locator **222** and another device, e.g., a cell tower, a satellite, etc., to determine a geo-location of the device locator **222**, and the geo-location of the device locator **222** is the same as a geo-location of the monitoring device **108**A. The geo-location of the monitoring device **108**A is the same as a geo-location of the user **112**A when the user **112**A is wearing the monitoring device **108**A.

The method **102** also includes storing, in an operation **122**, during the period of time of activity performed by the user **112**A, the activity that is detected in the operation **104** and the corresponding geo-location data that is obtained in the operation **118**. The geo-location data that is obtained in the operation **118** corresponds to the activity detected in the operation **104** when the geo-location is obtained and the activity is detected at the same time or during the same time period. For example, when the user **112**A wearing the monitoring device **108**A is performing an activity at a longitude **1** and a latitude **1**, a geo-location that includes the longitude **1** and the latitude **1** corresponds to the activity. In this example, the position sensor **220** determines that the user **112**A is performing the activity and the device locator **222** determines that the user **112** is at the longitude **1** and latitude **1** at the same time the user **112**A is performing the activity. To further illustrate, the detected activity corresponds to the geo-location data when the activity is detected at a time the monitoring device **108**A is located at the geo-location.

The operation **122** of storing is performed by the memory device **280** (FIG. **3**A) of the monitoring device **108**A or by a combination of the processor **234** of the monitoring device **108**A and the memory device **280** of the monitoring device

108A. For example, the processor **234** writes, e.g., stores, etc., data to be stored in the memory device **280**.

The method **102** further includes analyzing, in an operation **124**, the activity detected in the operation **104** and the corresponding geo-location data obtained in the operation **118** to identify one or more events, e.g., an event 126_1, an event 126_2, an event 126_3, an event 126_4, an event 126_5, an event 126_6, an event 126_7, an event 126_8, an event 126_9, an event 126_{10}, an event 128_1, an event 128_2, an event 128_3, an event 128_4, an event 128_5, an event 128_6, etc., which are described with reference to FIGS. **7**A and **7**E. The events 126_1, 126_2, 126_3, 126_4 126_5, 126_6, 126_7, 126_8, 126_9, and 126_{10} are displayed within an event region **730** of FIG. **7**A. The events 128_1, 128_2, 128_3, 128_4, 128_5, and 128_6 are displayed within a GUI **394** (FIG. **7**E).

Each event occurs over a period of time. For example, the event 126_1 occurs over a time period, e.g., from 12 AM to 8 AM, etc., and the event 126_4 occurs over a time period, e.g., from a time between 8 AM and 9 AM to 3 PM, etc.

As further shown in FIG. **7**A, each event 126_1, 126_2, 126_3, 126_4 126_5, 126_6, 126_7, 126_8, 126_9, and 126_{10} is a portion of a GUI **370**, which is an example representation of the GUI data **186** (FIG. **2**A). For example, each event 126_1, 126_2, 126_3, 126_4 126_5, 126_6, 126_7, 126_8, 126_9, and 126_{10} includes a textual and/or a graphical data portion of the GUI **370**. To further illustrate, the event 126_4 includes a graphical data portion that shows activity levels, e.g., amounts, etc., of an activity performed by the user **112**A. Moreover, in this illustration, the event 126_4 includes a time period during which the activity is performed and indicates the activity, e.g., golfing, etc. In this illustration, the activity indicates a location, e.g., a golf course. As another illustration, the event 126_6 includes a graphical data portion that shows activity levels of an activity performed by the user **112**A. Moreover, in this illustration, the event 126_6 includes a time period during which the activity is performed and includes a location, e.g., a home of the user **112**A, etc., at which the activity is performed.

Each event is associated, e.g., linked, corresponded, related, etc., with a group of activity data and each group of activity data is associated, e.g., linked, corresponded, etc., related, with a location/activity identifier. For example, referring to FIG. **7**A, the event 126_4 includes a group **130**A of activity data and the event 126_6 includes a group **130**B of activity data. The group **130**A includes activity levels of an activity performed by the user **112**A during a period of time and the group **130**A is associated with a location/activity identifier **132**D. Similarly, the group **130**B includes activity levels of an activity performed by the user **112**A during a period of time, e.g., a time period between a time between 3 pm and 4 pm and a time between 5 pm and 6 pm, etc., and the group **130**B is associated with a location/activity identifier **132**A.

Moreover, similarly, a group of activity data of the event 126_1 is associated with the location/activity identifier **132**A, a group of activity data of the event 126_2 is associated with a location/activity identifier **132**B, a group of activity data of the event 126_3 is associated with a location/activity identifier **132**C, a group of activity data of the event 126_5 is associated with the location/activity identifier **132**C, a group of activity data of the event 126_7 is associated with the location/activity identifier **132**C, a group of activity data of the event 126_8 is associated with the location/activity identifier **132**A, a group of activity data of the event 126_9 is associated with a location/activity identifier **132**C, and a group of activity data of the event 126_{10} is associated with a location/activity identifier **132**A. Furthermore, with reference to FIG. **7**E, a group of activity data of the event 128_1 is associated with a location/activity identifier **134**A and a group of activity data of the event 128_3 is associated with a location/activity identifier **134**B. A group of activity data is associated with a location/activity identifier to provide a context as to which activity is performed and where. For example, an amount of calories burned by a user are displayed in a background in which an icon representing an activity of walking performed by the user is shown and/or an icon representing a public park is shown. The amount of calories is burned when the user is walking and/or in the public park and/or is walking in the public park.

Referring back to FIG. **6**A, a location/activity identifier is generated by the processor **234** using the geo-location data, which is obtained in the operation **118**, and/or activity data, which is obtained in the operation **104**. For example, the processor **234** (FIG. **3**A) of the monitoring device **108**A determines that the geo-location-location database indicates a correspondence between a location of the user **112**A and a set that includes one or more longitudes at which an activity is performed by the user **112**A, one or more latitudes at which the activity is performed, and/or one or more altitudes at which the activity is performed, and assigns the location/activity identifier **132**D to represent the location. As another example, the processor **234** determines that a distance traveled by the user **112**A in a period of time is within an upper limit and a lower limit. The period of time is received from the time measurement device **232** of the monitoring device **108**A. The distance traveled by the user **112**A is received from the position sensor **220** and/or the device locator **222** of the monitoring device **108**A. As another example, the processor **234** receives a selection from the user **112**A via the user interface **274** (FIG. **3**A) of the monitoring device **108**A that one or more geo-locations at which the user **112**A performs an activity correspond to a location of the user **112**A, and assigns a location/activity identifier to represent the location.

The operation **124** is performed by the processor **234** (FIG. **3**A) based on the activity detected in the operation **104** and/or the geo-location data obtained in the operation **118**, and a time period during which the activity is performed. The processor **234** receives one or more amounts of time of performance of an activity during a time period from the time measurement device **232** (FIG. **3**A), and/or receives one or more geo-locations at which the activity is performed during the time period from the device locator **222** (FIG. **3**A), and receives one or more activity levels of the activity from the position sensor **220** (FIG. **3**A) to perform the operation **124**. For example, the processor **234** determines that the user **112**A is in a vehicle upon determining that a speed of travel of the user **112**A is greater than s_1 miles per hour. The speed s_1 is a running or walking speed of one or more users. The processor **234** determines a speed of travel of the user **112**A based on geo-location data obtained in an hour of one or more geo-locations of the user **112**. Geo-location data is received from the device locator **222** (FIG. **3**A) of the monitoring device **108**A and a measurement of the hour is received from the time measurement device **232** (FIG. **3**A).

As another example, the processor **234** determines whether the user **112**A is in a vehicle, or is riding a bicycle or a skateboard, or is undergoing ambulatory motion based on a speed of the user **112**A and motion of a body portion of the user **112**A. To illustrate, when the processor **234** determines that a speed of the user **112**A is greater than a pre-determined number of miles per hour and motion of the body portion is less than a pre-determined amount of motion, the processor **234** determines that the user **112**A is in a vehicle and is not walking or running. As another illustration, when the processor **234** determines that a speed of the user **112**A is less than the pre-determined number of miles per hour and motion of the body portion is greater than the pre-determined amount of motion, the processor **234** determines that the user **112**A is performing the ambulatory motion. Examples of ambulatory motion include walking, running, jogging, exercising, etc. An example of the body portion includes an arm of the user **112**A. In various embodiments, a speed of the user **112**A is determined by a device locator or a processor based on an amount of distance between two geo-locations and time of the user **112**A at each of the geo-locations. In some embodiments, a speed of the user **112**A is determined by a position sensor or a processor based an amount of distance between two positions and time of occurrence of each of the positions.

As yet another example, the processor **234** determines that the user **112**A is running upon determining that a speed of travel of the user **112**A is greater than s_2 miles per hour and a number of steps taken by the user **112**A is greater than ss_1 per hour. The speed s_2 is a walking speed of one or more users. A number of steps are received by the processor **234** from the position sensor **220** (FIG. **3**A) of the monitoring device **108**A. As another example, the processor **234** determines that the user **112**A is walking upon determining that a number of steps taken by the user **112**A is less than ss_1 per hour and greater than ss_2 per hour. As yet another example, the processor **234** determines that the user **112**A is in a vehicle upon determining that a speed of travel of the user **112**A is greater than s_3 miles per hour and a number of steps taken by the user **112**A is less than ss_3 per hour.

As another example, the processor **234** determines that the user **112**A is moving around upon determining that a number of steps taken by the user **112**A is less than ss_4 per hour. As yet another example, the processor **234** determines that the user **112**A is sedentary upon determining that the user **112**A is not walking, running, not moving around, and not in a vehicle. As another example, the processor **234** determines that the user **112**A is sleeping upon determining that the user **112**A is sedentary for greater than an amount of time.

In some embodiments, the processor **234** determines a speed of travel of the user **112**A based on geo-location data obtained over a period of time of one or more geo-locations of the user **112** and the period of time.

The time period during which the activity is performed at a location is determined by the processor **234** based on a sum of amounts of time measured by the time measurement device **232** for performing the activity at one or more geo-locations corresponding to, e.g., included within, linked with, etc., the location.

The operation **124** of analyzing the detected activity and the corresponding geo-location data during the period of time includes determining a time element of segregation of the activity detected at the operation **104**. For example, a period of time during which an activity is performed is segmented into one or more time elements. As another example, a period of time during which an activity is performed is segmented into one or more time elements, and each time element includes a graphical property and/or text to represent the time element. Examples of a time element include a fraction of a minute, or a minute, or a fraction of an hour, or an hour, etc. Further examples of a time element are shown as a time element $\mathbf{144}_1$ and a time element $\mathbf{144}_2$ in FIG. **7**A. The time element $\mathbf{144}_1$ is a time of day at which a golf activity having an activity level is performed by the user **112**A. Moreover, the time element $\mathbf{144}_2$ is another time of day at which a golf activity having an activity level is performed by the user **112**A. The activity level at the time element $\mathbf{144}_2$ is lower than the activity level at the time element $\mathbf{144}_1$. In some embodiments, the activity level at the time element $\mathbf{144}_2$ is higher than or the same as the activity level at the time element $\mathbf{144}_1$. The time element $\mathbf{144}_1$ includes text, e.g., 9 AM, etc.

The operation **124** of analyzing the detected activity and the corresponding geo-location data during the period of time further includes determining an activity level for each time element. For example, an activity level $\mathbf{146}_1$ (FIG. **7**A) is determined as being performed at the time element $\mathbf{144}_1$ and an activity level $\mathbf{146}_2$ (FIG. **7**A) is determined as being performed at the time element $\mathbf{144}_2$. As another example, the activity level $\mathbf{146}_1$ (FIG. **7**A) is determined as being performed at the time element $\mathbf{144}_1$ and is determined to include text and/or a graphical property, e.g., a dark gray bar, etc., and the activity level $\mathbf{146}_2$ (FIG. **7**A) is determined as being performed at the time element $\mathbf{144}_2$ and is determined to include text and/or a graphical property, a dark gray bar, etc.

The operation **124** of analyzing the detected activity and the corresponding geo-location data during the period of time also includes determining a location/activity identifier of a location and/or activity for each time element and for each activity level. For example, the processor **234** determines that an activity level that occurs at a time element is of an activity that occurs at one or more geo-locations that correspond to a location and/or that correspond to an activity, e.g., a home of the user **112**, a building, a park, an office, golfing, walking, running, a commercial place, an eatery, a work place, a vehicle, a golf course, a sandwich shop, or any other location, etc., and determines a location/activity identifier that represents the location and/or activity.

As another example, the processor **234** determines that the activity level $\mathbf{146}_1$ is of an activity that occurs at one or more geo-locations of a golf course and determines the location/activity identifier **132**D that represents golfing. In this example, the processor **234** accesses correspondence between geo-location data and location data stored within the geo-location-location database to determine whether the one or more geo-locations correspond to the golf course and/or also accesses position data of the monitoring device **108**A from the position sensor **220** to determine that the activity is golfing. As yet another example, the processor **234** determines that the activity level $\mathbf{146}_2$ is of an activity that occurs at one or more geo-locations of a golf course and determines the location/activity identifier **132**D. In this example, the processor **234** applies a selection received from the user **112**A via the user interface **274** (FIG. **3**A) to determine that one or more geo-locations at which the activity level $\mathbf{146}_2$ occurs correspond to a golf course. In this example, the geo-locations at which the activity level $\mathbf{146}_2$ occurs are the same or different from one or more geo-locations determined by the processor **234** from the geo-location-location database to correspond to a golf course.

Examples of a location/activity identifier include a graphical element, e.g. an icon, a bar, a background, a background including a bar, an icon having a pointer, a symbol, a graphical symbol, text, a graphical image, a symbol having a pointer, a trademark, a trademark having a pointer, a registered mark, a registered mark having a pointer, an animation icon, an animation icon having a pointer, an animation, an animation having a pointer, a video icon, a video icon having a pointer, a video, a video having a pointer, an audio icon, an audio icon having a pointer, an audio, an audio having a pointer, a multimedia icon, a multimedia icon having a pointer, a multimedia, a multimedia having a pointer, or a combination thereof, etc., that represents a location at which the activity is performed.

A location/activity identifier has a graphical element and/or text. For example, the location/activity identifier **380**B includes an icon of a person walking. As another example, the location/activity identifier **380**D includes an icon of a person golfing with a golf club.

The operation **124** of analyzing the detected activity and the corresponding geo-location data during the period of time further includes associating the activity level with the time element and the location/activity identifier. Upon determining the location/activity identifier for each time element and for each activity level, the processor **234** associates, e.g., establishes a link between, establishes a correspondence between, etc., the time element and the activity level with the location/activity identifier. For example, the processor **234** establishes a link between the time element $\mathbf{144}_1$, the activity level $\mathbf{146}_1$, and the location/activity identifier **132**D. As another example, the processor **234** establishes a link between the time element $\mathbf{144}_2$, the activity level $\mathbf{146}_2$, and the location/activity identifier **132**D.

The operation **124** of analyzing the detected activity and the corresponding geo-location data during the period of time also includes aggregating the associated activity levels and time elements over the period of time to indicate, using the associated location/activity identifier, a location of occurrence of the activity levels and of a group of activity data. The group of activity data includes the activity levels and the period of time. The processor **234** aggregates, e.g., combines, accumulates, etc., over a period of time the activity levels and time elements that are associated with a location/activity identifier of an activity. The period of time over which the processor **234** aggregates is continuous, e.g., from 1 pm to 2 pm on a day, from January to February of a year, from year 2000 to year 2004 of a decade, etc. With reference to FIG. **7**A, the processor **234** generates a time line **850** including a time period **852** over which the activity represented by the activity identifier **380**D is performed. The timeline **850** includes including a chronological order, e.g., a continuous order, etc., of time within the time period **852**. Further examples of the chronological order are provided below.

In some embodiments, a timeline includes a chronological order, e.g., a consecutive order, a continuous order, etc., of time. For example, a timeline includes all times between 8 AM on a first day and 12 AM on a second day in hourly time intervals, or in time intervals of minutes, or time intervals of seconds. The second day is consecutive to the first day. As another example, a timeline includes all times of two or more consecutive days in hourly time intervals. As yet another example, a timeline includes all times of two or more consecutive months in time intervals of days. As another example, a timeline includes all times between two dates in time intervals of months or time intervals of years or time intervals of days or in time intervals of hours. As another example, a timeline includes a time interval of all times between two dates or two times during a day. As yet another example, a timeline includes a line along which hours, or days, or months, or years are plotted. These examples are provided without limitation to other possible configurations, layouts, formats, presentations, so long as time is organized or shown in some manner.

The aggregated activity levels, time elements, and the associated location/activity identifier are represented, by the processor **234**, within one or more graphical elements and/or text of a background that represent an event to generate or identify the event. For example, the processor **234** assigns one or more graphical elements to an area, within the GUI **370** (FIG. **7**A), to generate the event $\mathbf{126}_4$ that includes the group **130**A of activity data, the location/activity identifier **380**D and a background **150**, e.g., a gray-shaded area, a shaded area, an area having a graphical property, etc. The group **130**A of activity data and the location/activity identifier **380**D are overlaid on the background **150**. In some embodiments, the background **150** is overlaid on the group **130**A of activity data and the location/activity identifier **380**D. The event $\mathbf{126}_4$ includes the time element $\mathbf{144}_1$ aligned, e.g., vertically, horizontally, oblique, etc., with the activity level $\mathbf{146}_1$ and further includes the location/activity identifier **132**D including or attached to a pointer **380**D. The pointer **380**D points to the event $\mathbf{126}_4$ that includes the activity level $\mathbf{146}_1$ and the time element $\mathbf{144}_1$. Similarly, as shown in FIG. **7**A, a pointer **380**A that is included within or is attached to the location/activity identifier **132**A points to the event $\mathbf{126}_1$, a pointer **380**B that is included within or is attached to the location/activity identifier **132**B points to the event $\mathbf{126}_2$, and a pointer **380**C that is included within or is attached to the location/activity identifier **132**C points to the event $\mathbf{126}_3$.

The background **150** is used to distinguish the event $\mathbf{126}_4$ from one or more of the other events $\mathbf{126}_1$, $\mathbf{126}_2$, $\mathbf{126}_3$, $\mathbf{126}_5$, $\mathbf{126}_6$, $\mathbf{126}_7$, $\mathbf{126}_8$, $\mathbf{126}_9$, and $\mathbf{126}_{10}$. For example a background **854** corresponding to the event $\mathbf{126}_6$ has a different graphical property than the background **150**.

It should be noted that in some embodiments, a location/activity identifier does not include and is not attached to a pointer. For example, the event $\mathbf{126}_4$ includes the location/activity identifier **132**D without the pointer **380**D.

In various embodiments, a group of activity data includes a location/activity identifier in addition to one or more activity levels and one or more time elements. For example, the group **130**A of activity data includes one or more activity levels, one or more time elements, and the location/activity identifier **380**D.

In several embodiments, each activity level is assigned a graphical property by the processor **234**. For example, as shown in FIG. **7**A, the activity level $\mathbf{146}_1$ is assigned a graphical property $\mathbf{148}_1$ and the activity level $\mathbf{146}_2$ is assigned a graphical property $\mathbf{148}_2$. The graphical property $\mathbf{148}_2$ may be the same or different from the graphical property $\mathbf{148}_1$. For example, the graphical property $\mathbf{148}_2$ has the same color as that of the graphical property $\mathbf{148}_1$. As another example, the graphical property $\mathbf{148}_2$ has the same texture and color as that of the graphical property $\mathbf{148}_1$.

In some embodiments, the method **102** is performed by the monitoring device **108**B (FIG. **3**B) except instead of the operation **104**, the biological sensor **294** performs an operation of detecting a physiological parameter of the user **112**A who is located on the monitoring device **108**B. Moreover, in these embodiments, the operation **118** of obtaining geo-location data for the monitoring device **108**B is performed by the device locator **306** (FIG. **3**B). Further, in these embodiments, the operation **122** of storing the detected physiological parameter and the corresponding geo-location data is performed by the processor **302** (FIG. **3**B) or by a combination of the processor **302** and the memory device **298** (FIG. **3**B). In these embodiments, the operation **124** of analyzing the detected physiological parameter and the corresponding geo-location data during the period of time to identify one or more events is performed by the processor **302** (FIG. **3**B) of the monitoring device **108**B.

FIG. **6**B is a flowchart of an embodiment of a method **160** for segmenting a period of time into identification of locations of a user performing activities. The method **160** is executed by the monitoring device **108**A (FIG. **3**A). In the method **160**, the operations **104**, **118**, and **122** are performed.

The method **160** includes transferring, e.g., sending, etc., in an operation **162**, from time to time, to the computing device **166** (FIG. **5**) the activity that is detected at the operation **104** and that corresponds to the geo-location data that is obtained at the operation **118**. For example, activity data is transferred periodically, e.g., every fraction of a second, every second, every minute, every fraction of a minute, etc., or aperiodically, e.g., randomly, etc., to the computing device **166** upon reception of request from the computing device **166**.

The operation **162** of transferring is performed by the wireless communication device **278** (FIG. **3**A) via a wireless link, e.g., the wireless link **168** (FIG. **2**A), the wireless link **170** (FIG. **2**B), etc., between the monitoring device **108**A (FIG. **3**A) and the computing device **166**. For example, the wireless communication device **278** executes a Bluetooth or a Wi-Fi protocol to transfer data to the computing device **166** via a wireless link. In some embodiments in which a wired link is used between the monitoring device **108**A and the computing device **166**, the operation **162** of transferring is performed by a wired communication device of the monitoring device **108**A and the wired communication device is connected via a wired link to the wired communication device of the computing device **166**. In various embodiments, the wireless communication device **278** transfers data via a wireless communication link and the network **176** (FIG. **3**A) to the server **228** (FIG. **3**A) without transferring data via the computing device **166**. In several embodiments, a wired communication device of the monitoring device **108**A transfers via a wired communication link and the network **176** to the server **228** without transferring data via the computing device **166**. For example, the wired communication device of the monitoring device **108**A executes a communication protocol, e.g., a Transmission Control Protocol over Internet Protocol (TCP/IP), a User Datagram Protocol over Internet Protocol (UDP/IP), etc., to communicate data with the server **228** via the network **176**.

In some embodiments, the operations **104**, **118**, and **112** are performed by the monitoring device **108**B (FIG. **3**B) with the changes described above with respect to the method **102** (FIG. **6**A). Moreover, in these embodiments, the operation **162** of transferring, from time to time, the detected activity corresponding to the geo-location data to the computing device **166** is performed by the wireless communication device **300** of the monitoring device **108**B or by a wired communication device of the monitoring device **108**B.

FIG. **6**C is a diagram of an embodiment of a method **170** for segmenting a period of time into identification of locations of a user performing activities. The method **170** is executed by the server **228** (FIGS. **2**A & **2**B). The method **170** includes an operation **172** of enabling access to the user account **174** (FIG. **2**A) via the computing device **166** (FIG. **5**) over the network **176** (FIG. **2**A). The processor **190** (FIG. **2**A) of the server **228** performs the operation **172** of enabling access to the user account **174**.

The user **112**A (FIG. **1**A) uses the user interface **274** (FIG. **3**A) of the monitoring device **108**A or the input device **340** (FIG. **5**) of the computing device **166** to provide the authentication information to access the user account **174**. Upon receiving the authentication information via the network **176**, the processor **190** (FIG. **2**A) of the server **228** or another processor of another server determines whether the authentication information is authentic. Upon determining that the authentication information is authentic or upon receiving the determination from the other processor of the other server, the processor **190** enables access to the user account **174** to the user **112**A. When access to the user account **174** is enabled, a representation of the user account **174** is rendered by the processor **234** on the display device **276** (FIG. **3**A) of the monitoring device **108**A or is rendered by the processor **226** of the computing device **166** on the display device **352** (FIG. **5**) of the computing device **166**.

The method **170** further includes receiving, in an operation **178**, monitoring data for the user account **174**. The monitoring data includes the activity detected at the operation **104** (FIGS. **6**A & **6**B) of the monitoring device **108**A (FIG. **3**A). The monitoring data includes geo-location data obtained at the operation **118** (FIG. **6**A).

The operation of receiving **178** is performed by the NIC **254** (FIG. **2**A) of the server **228**. The monitoring data is received, via the network **176** (FIGS. **2**A, **2**B, & **3**A), from the NIC **356** (FIG. **5**) of the computing device **166** that has received the monitoring data from the wireless communication device **278** (FIG. **3**A) of the monitoring device **108**A or from a wired communication device of the monitoring device **108**A. In some embodiments, the monitoring data is received from the wireless communication device **278** of the monitoring device **108**A and the network **176** without use of the computing device **166**.

In some embodiments, the NIC **254** applies a communication protocol to receive the monitoring data. For example, the NIC **254** depacketizes one or more packets to obtain the monitoring data.

The method **170** includes processing, in an operation **180**, the monitoring data to identify one or more events. The operation **180** of processing is similar to the operation **124** (FIG. **6**A) of analyzing the detected activity and the corresponding geo-location data during a period of time to identify one or more events. For example, the operation **180** is the same as the operation **124** except that the operation **180** is performed by the processor **190** (FIG. **2**A) of the server **228**. The operation **180** is performed to generate the GUI data **186** (FIG. **2**A). The GUI data **186** includes event data of one or more events. For example, the GUI data **186** includes data that is rendered to display the GUI **370** (FIG. **7**A). As another example, the GUI data **186** includes data that is rendered to display the GUI **394** (FIG. **7**E).

The method **170** includes sending, in an operation **182**, in response to a request from a consuming device the GUI data **186** (FIG. **2**A). Examples of the consuming device include the computing device **166** (FIG. **5**) or the monitoring device **108**A (FIG. **3**A). For example, when the user **112**A is provided access to the user account **174** (FIG. **2**A), a request is received from the NIC **356** (FIG. **5**) to send the GUI data **186**. Upon receiving the request, the NIC **254** (FIG. **2**A) of the server **228** applies a communication protocol for sending the GUI data **186** via the network **176** to the NIC **356** of the computing device **166** for display on the display device **352** of the computing device **166**. As another example, when the user **112**A is provided access to the user account **174**, a request is received from the wireless communication device **278** of the monitoring device **108**A or a wired communication device of the monitoring device **108**A via the network **176**. Upon receiving the request, the NIC **254** (FIG. **2**A) of the server **228** applies a communication protocol for sending the GUI data **186** via the network **176** to the wireless communication device **278** of the monitoring device **108**A or to the wired communication device of the monitoring device **108**A. The GUI data **186** is sent via the computing device **166** or without using the computing device **166**.

The GUI data **186** includes graphics, e.g., graphical elements that represent the events $\mathbf{146}_1$ and $\mathbf{146}_2$ (FIG. **7**A), that represent the background **150** (FIG. **7**A), that represent the location/activity identifiers **132**A, **132**B, **132**C, and **132**D (FIG. **7**A), etc. The GUI data **186** further includes text, e.g., text **188**A ("e.g., HOME" in FIG. **7**A) that describes, e.g., identifies, etc., a location that the user **112**A has reached during a day, text **188**B ("e.g., HANS' PARENTS HOUSE" in FIG. **7**A) that describes another location that the user **112**A has reached during the day another time of the day, text **188**C (e.g., "1 AM" in FIG. **7**A) that represents a time of the day, text **188**D (e.g., "2 AM" in FIG. **7**A) that represents yet another time of the day, etc.

The graphics and text segments a period of time over which one or more activities are performed into events that are graphically distinct from each other. For example, as shown in FIG. **7**A, the event $\mathbf{126}_2$ that includes activity data of an activity of walking is graphically distinct, e.g., has a lighter shade, etc., than the event $\mathbf{126}_4$ that includes activity data of an activity of golfing. As another example, as shown in FIG. **7**A, an event includes activity data representing an activity is represented by different graphical elements than an event that includes activity data representing the same or a different activity.

FIG. **6**D is a flowchart of an embodiment of a method **200** for segmenting a period of time into identification of locations of a user performing activities. The method **200** is executed by the monitoring device **108**B (FIG. **3**B).

The method **200** includes determining, in an operation **202**, a geo-location of the monitoring device **108**B over a time period. The geo-location of the monitoring device **108**B is determined by the device locator **306** (FIG. **3**B). The method **200** further includes determining, in an operation **204**, a physiological parameter of the user **112**A over a period of time. The operation **204** is performed by the biological sensor **294** (FIG. **3**B) of the monitoring device **108**B. For example, the biological sensor **294** measures a change in weight of the user **112**A over a period of time for which the geo-location is determined in the operation **202**. As another example, the biological sensor **294** measures a change in BMI of the user **112**A over a period of time for which the geo-location is determined in the operation **202**. A period of time is measured by the time measurement device **395** (FIG. **3**B).

The method **200** also includes associating, in an operation **206**, the geo-location determined in the operation **202** with the physiological parameter determined in the operation **204** to facilitate determination of a group of activity data and a location of the monitoring device **108**B. The processor **302** (FIG. **3**B) of the monitoring device **108**B performs the operation **206**. For example, the processor **302** establishes a link between the geo-location data and the physiological parameter. The processor **302** determines a location of the monitoring device **108**B based on the geo-location data and the geo-location-location database. The processor **302** further determines a group of activity data that includes one or more amounts of a physiological parameter that provide a measure of an activity performed over a period of time. For example, when the user **112**A exercises over a period of time, the user **112**A may lose weight. As another example, when the user **112**A is sedentary over a period of time, the user **112**A may gain weight. The processor **302** then generates event data that includes a relation between the location and the group of activity data. For example, the processor **302** determines that one or more amounts of a physiological parameter occur at a location over a period of time and generates a relationship, e.g., correspondence, link, etc., between the amounts, the location, and the time period.

FIG. **6**E is a flowchart of an embodiment of a method **210** for segmenting a period of time into identification of locations of a user performing activities. The method **210** is performed by one or more monitoring devices, e.g., the monitoring device **108**A, the monitoring device **108**B, a combination thereof, etc.

The method **210** includes an operation **212** of detecting an activity and/or a physiological parameter of the user **112**A with one or more monitoring devices for a period of time. For example, the position sensor **220** of the monitoring device **108**A (FIG. **3**A) detects an activity performed by the user **112**A and the biological sensor **294** of the monitoring device **108**B (FIG. **3**B) detects a physiological parameter of the user **112**A.

The method **210** further includes an operation **214** of obtaining geo-location data for the monitoring devices for the period of time for which the operation **212** is performed. For example, geo-location data of geo-location of the monitoring device **108**A is measured by the device locator **222** of the monitoring device **108**A (FIG. **3**A) and geo-location data of geo-location of the monitoring device **108**B is measured by the device locator **306** of the monitoring device **108**B (FIG. **3**B). A period of time is measured by the time measurement device **232** (FIG. **3**A) of the monitoring device **108**A and by the time measurement device **295** of the monitoring device **108**B (FIG. **3**B).

The method **210** includes an operation **216** of saving, in an operation **216**, the detected physiological parameter and the detected activity in the operation **212**. For example, the operation **216** of saving the detected activity is performed by the processor **234** of the monitoring device **108**A and/or by the processor **234** and the memory device **280** of the monitoring device **108**A. As another example, the operation **216** of saving the detected physiological parameter is performed by the processor **302** of the monitoring device **108**B and/or by the memory device **298** (FIG. **3**B) of the monitoring device **108**B.

The method **210** includes an operation **218** of transferring, from time to time, the detected physiological parameter and the detected activity corresponding to the geo-location data to the computing device **166** (FIG. **5**) and/or to the server **228**. For example, the operation **218** of transferring is performed by the wireless communication device **278** (FIG. **3**A) of the monitoring device **108**A or by a wired communication device of the monitoring device **108**A. As another example, the operation **218** of transferring is performed by the wireless communication device **300** of the monitoring device **108**B or by a wired communication device of the monitoring device **108**B. The detected activity and the detected physiological parameter are transferred wirelessly to the wireless communication device **224** (FIG. **5**) of the computing device **166**. In some embodiments, the detected activity and the detected physiological parameter are transferred via a wired link, e.g., a cable, a wire, etc., to the wired communication device (not shown) of the computing device **166**. In several embodiments, the detected activity and the detected physiological parameter are transferred via a wired link or a combination of a wireless link and a wired link and the network **176** to the server **228** without use of the computing device **166**.

Moreover, in some embodiments, the geo-location data is also transferred, from time to time, to the computing device **166** and/or to the server **228**. For example, the wireless communication device **278** (FIG. **3**A) of the monitoring device **108**A transfers geo-location data to the wireless communication device **224** of the computing device **166** or a wired communication device of the monitoring device **108**A transfers the geo-location data to the wired communication device of the computing device **166**. As another example, the geo-location data is transferred wirelessly by the wireless communication device **300** of the monitoring device **108**B or by a wired communication device of the monitoring device **108**B to the computing device **166**. In several embodiments, the geo-location data is transferred via a wired link or a combination of a wireless link and a wired link and the network **176** to the server **228** without use of the computing device **166**.

FIG. **6**F is a flowchart of an embodiment of a method **221** for segmenting a period of time into identification of locations of a user performing activities. The method **221** is performed by the monitoring device **108**A, the monitoring device **108**B, by the computing device **166**, or a combination thereof.

The method **221** includes receiving, in an operation **223**, detected activity and/or physiological parameter of the user **112**A. For example, the processor **234** (FIG. **3**A) of the monitoring device **108**A receives detected activity from the position sensor **220** (FIG. **3**A). As another example, the processor **302** of the monitoring device **108**B receives detected physiological parameter from the biological sensor **294** (FIG. **3**B) of the monitoring device **108**B. As yet another example, the processor **226** of the computing device **166** (FIG. **5**) receives the detected activity from the monitoring device **108**A and/or receives the physiological parameter from the monitoring device **108**B.

The method **221** includes an operation **227** of classifying detected activity and/or the physiological parameter. For example, the processor **234** (FIG. **3**A) of the monitoring device **108**A classifies the amount of movement into walking, running, sedentary, sleeping, moving around, or playing a sport. As another example, the processor **302** of the monitoring device **108**B classifies the physiological parameter into a type of physiological parameter, e.g., BMI, heart rate, blood pressure, weight, etc. As another example, the processor **226** of the computing device **166** classifies the detected activity and/or the physiological parameter.

The method **221** further includes an operation **229** of determining a location of the user **112**A. For example, the processor **234** of the monitoring device **108**A determines a location of the user **112**A based on geo-location data and/or based on detected activity and/or based on the geo-location-location database. The geo-location data is received by the processor **234** from the device locator **222** of the monitoring device **108**A and the detected activity is received by the processor **234** from the position sensor **220** (FIG. **3**A) of the monitoring device **108**A. Moreover, a determination of a location based on the geo-location data is made by the processor **234** based on the geo-location data and/or the activity data and/or the geo-location-location database.

As another example, the processor **226** of the computing device **166** determines a location of the user **112**A based on geo-location data and/or based on detected activity and/or based on a physiological parameter, and/or based on the geo-location-location database. The geo-location data is received by the processor **226** from the device locator **222** of the monitoring device **108**A or from the device locator **306** of the monitoring device **108**B and the detected activity is received by the processor **226** from the position sensor **220** (FIG. **3**A) of the monitoring device **108**A and/or a physiological parameter is received from the biological sensor **294** of the monitoring device **108**B. Moreover, a determination of a location based on the geo-location data is made by the processor **234** based on the geo-location data and/or the activity data and/or the physiological parameter and/or the geo-location-location database. For example, upon determining that there is a lack of change beyond an amount in a physiological parameter over a period of time, the processor **234** determines that the user **112**A has not left one or more geo-locations that correspond to his/her home during the period of time.

In some embodiments, the processor **226** classifies an activity based on a physiological parameter of the user **112**A, and/or a movement of the user **112**A, and/or a location of the user **112**A. For example, a heart rate of the user **112**A is monitored, a movement of an arm of the user **112**A is determined, and a location of the user **112**A is determined to determine that the user **112**A is training with weights in a gym and not swimming in the gym. As another example, an amount of calories burned by the user **112**A is measured, a movement of an arm of the user **112**A is determined, and a location of the user **112**A is determined to indicate that the user **112**A is swimming in a gym as opposed to running in the gym.

The method **221** further includes an operation **231** of overlaying of the classified activity performed by the user **112**A and/or of the classified physiological parameter of the user **112**A and/or of a location arrived at by the user **112**A on a map. For example, the processor **234**, the processor **302**, or the processor **226** determines generates event data that includes the map, the classified activity, and/or the classified physiological parameter. In some embodiments, instead of the operation **231**, an operation of overlaying the map is performed on the classified activity and/or the classified physiological parameter and/or the location arrived at by the user **112**A.

Examples of overlaying a graphical element include placing the graphical element on a display screen of a display device, placing content that is viewable on the display screen, positioning the graphical element on the display screen, locating the graphical element on the display screen, or associating the graphical element with the display screen, etc. A graphical element may be overlaid on another graphical element or on a display screen. When a graphical element is overlaid on a display screen, there may not be another graphical element behind the overlaying graphical element.

In some embodiments, an overlay is provided to cover a portion of a display screen, a background on the display screen, or a graphical element on the display screen. An overlay may be opaque, translucent, or transparent. For example, when a first graphical element covers opaquely a second graphical element, the second graphical element is not visible and the first graphical element is visible. When the first graphical element covers translucently the second graphical element, the second graphical element does not have full visibility, e.g., is blurrier than the first graphical element, is dimmer than the first graphical element, is lighter in shade than the first graphical element, or a combination thereof, etc., and the first graphical element is visible. When the first graphical element covers transparently the second graphical element, the second graphical element is fully visible and the second graphical element is visible. Without limitation, the term overlay simply means that some content is added to some area of a screen.

The content, in the examples shown, and without limitation to other possible permutations, may be a graphic, text, icon, text and images, an image, an avatar, an animation, text and animations, color badges, moving animations, etc.

In various embodiments, event data is generated based on positions that are obtained by a position sensor of a monitoring device and geo-locations obtained by a device locator of the computing device **166**. The geo-locations are of the computing device **166** when carried by the user **112**A. The computing device **166** transfers the geo-locations via a NIC and the network **176** to the server **228**. Moreover, the monitoring device transfers the positions via a communication device and the network **176** to the server **228**. The server **228** receives the geo-locations and the positions and generates the event data. In some embodiments, instead of the server **228**, a virtual machine generates the event data.

In some embodiments, a monitoring device receives the geo-location data that is obtained by a device locator of the computing device **166** and generates event data based on positions and the geo-locations. The monitoring device includes a position sensor that determines the positions of the monitoring device. The monitoring device receives the geo-locations via a communication device of the monitoring device and a communication device of the computing device **166**. The geo-locations are of the computing device **166** when carried by the user **112**A.

In several embodiments, the computing device **166** receives positions that are obtained by a position sensor of a monitoring device and generates event data based on positions and the geo-locations. The geo-locations are of the computing device **166** when carried by the user **112**A. The monitoring device includes a position sensor that determines the positions of the monitoring device.

In various embodiments, a portion of the event data is generated by a processor of a monitoring device and the remaining portion is generated by a processor of the computing device **166**. In several embodiments, a portion of event data is generated by a processor of a monitoring device, another portion of the event data is generated by a processor of the computing device **166**, and the remaining portion is generated by a processor of the server **228**. In various embodiments, a portion of event data is generated by a processor of a monitoring device, another portion of the event data is generated by a processor of the computing device **166**, and the remaining portion is generated by a virtual machine. In some embodiments, a portion of event data is generated by a processor of a monitoring device and the remaining portion is generated by a virtual machine or by the server **228**. In various embodiments, a portion of event data is generated by a processor of the computing device **166** and the remaining portion is generated by a virtual machine or by the server **228**.

FIG. **7**A is an embodiment of the GUI **370** that displays the events $\mathbf{126}_1$ thru $\mathbf{126}_{10}$. In some embodiments, the processor **234** (FIG. **3**A) highlights, e.g. bolds, colors, shades, etc., an activity level that is higher than or lower than the remaining activity levels by a threshold. The highlight distinguishes the activity level from one or more activity levels of one or more events that occur during a period of time. For example, the processor **234** provides a different color to an activity level **402** compared to remaining activity levels of the event $\mathbf{126}_{10}$ when the processor **234** determines that the activity level **402** is greater than the remaining activity levels by a threshold.

The GUI **370** is rendered by the processor **234** of the monitoring device **108**A to be displayed on the display device **276** (FIG. **3**A) of the monitoring device **108**A or by the processor **226** (FIG. **5**) of the computing device **166** to be displayed on the display device **352** (FIG. **5**) of the computing device **166**.

The processor **234** or the processor **226** combines amounts of time of a common activity over one or more periods of time to indicate a combined amount of time, e.g., a combined amount of time $\mathbf{138}_1$, a combined amount of time $\mathbf{138}_2$, a combined amount of time $\mathbf{138}_3$, a combined amount of time $\mathbf{138}_4$, etc., of performance of the common activity and a level, e.g., a level $\mathbf{140}_1$, a level $\mathbf{140}_2$, a level $\mathbf{140}_3$, a level $\mathbf{140}_4$, etc., of the common activity performed. For example, as shown in FIG. **7**A, the user **112**A drove a vehicle for 1 hour and 1 minute on a date **308** of March 1, Thursday. As another example, the processor **234** or the processor **226** sums periods of time for which the user **112**A performed the common activity on the date **308**. To illustrate, a period of time of occurrence of the event $\mathbf{126}_2$, a period of time of occurrence of the event $\mathbf{126}_5$, a period of time of occurrence of the event $\mathbf{126}_7$, and a period of time of occurrence of the event $\mathbf{126}_9$ are summed to determine a total time period of occurrence of a common activity of driving a vehicle.

In some embodiments, each level $\mathbf{140}_1$, $\mathbf{140}_2$, $\mathbf{140}_3$, $\mathbf{140}_4$ is a statistical activity level indicator, which indicates a statistical value of activity levels of an activity performed at one or more locations for one or more periods of time. For example, the level $\mathbf{140}_2$ indicates an average amount of calories burned by the user **112**A while walking on March 1^{st}. As another example, the level $\mathbf{140}_3$ indicates a maximum amount of steps taken by the user **112**A while running on March 1^{st}. Other examples of a statistical value include a minimum value, a moving average, a standard deviation, a median, etc.

Examples of a common activity are the same as that of an activity except that the common activity is the same over multiple periods of time. For example, a common activity is walking, running, golfing, etc.

In various embodiments, the processor **234** or the processor **226** combines activity levels of performance of the common activity over the combined amount of time to generate a combined activity level for each common activity. For example, activity levels of the event $\mathbf{126}_2$, activity levels of the event $\mathbf{126}_5$, activity levels of the event $\mathbf{126}_7$, and activity levels of the event $\mathbf{126}_9$ are summed to generate a combined activity level of a common activity of driving over the total time period to generate a combined activity level $\mathbf{140}_4$. Similarly, other combined activity levels $\mathbf{140}_1$, $\mathbf{140}_2$, and $\mathbf{140}_3$ are generated.

Moreover, in some embodiments, the processor **234** or the processor **226** combines amounts of time of one or more activities performed at a common location over one or more periods of time to generate a combined amount of time, e.g., a combined amount of time $\mathbf{138}_5$, a combined amount of time $\mathbf{138}_6$, a combined amount of time $\mathbf{138}_7$, etc., of performance of the one or more activities at the common location. For example, time of performance of all activities performed at a home of the user **112** on the date **308** are combined to generate the combined amount of time $\mathbf{138}_5$. As another example, time of performance of all activities performed at an office of the user **112** on March 1 are combined to generate the combined amount of time $\mathbf{138}_6$. A common location is a location at which one or more activities, e.g., a common activity, etc., are performed over one or more periods of time.

In several embodiments, the processor **234** or the processor **226** combines activity levels of performance of the one or more activities at the common location over a combined amount of time to generate a combined activity level, e.g., a combined activity level $\mathbf{140}_5$, a combined activity level $\mathbf{140}_6$, a combined activity level $\mathbf{140}_7$, etc., of one or more activities performed at the common location. For example, activity levels of an activity of walking done by the user **112**A at a home of the user **112**A on the date **308** are combined to generate the combined activity level 140_5. As another example, activity levels of one or more activities performed during the events 126_1, 126_6, and 126_{10} are combined to generate the combined activity level 140_5.

In some embodiments, each level 140_5, 140_6, 140_7 is a statistical activity level indicator, which indicates a statistical value of activity levels of one or more activities performed at a location for one or more periods of time. For example, the level 140_5 indicates an average amount of calories burned by the user **112**A by walking and exercising at home on March 1^{st}. As another example, the level 140_6 indicates a maximum amount of steps taken by the user **112**A while walking and sitting at work on March 1^{st}.

The GUI **370** further includes a reverse button **410** and a forward button **412**. The user **112**A selects the reverse button **410** via the user interface **274** (FIG. **3**A) or via the input device **340** (FIG. **5**) to view a GUI that displays one or more events, one or more combined activity levels, and/or one or more combined amounts of time on a date prior to the date **308**. Similarly, The user **112**A selects the forward button **412** via the user interface **274** (FIG. **3**A) or via the input device **340** (FIG. **5**) to view a GUI that displays one or more events, one or more combined activity levels, and/or one or more combined amounts of time on a date after the date **308**.

In various embodiments, the GUI **370** includes a time at which there is a change in an activity level beyond a limit in an amount of time. For example, the GUI **370** includes a wake-up time **414** and a bed time **416**. The position sensor **220** (FIG. **3**A) determines an amount of activity and based on the amount, the processor **234** or the processor **226** determines whether the amount of activity has crossed the limit in an amount of time. Upon determining that the amount of activity has crossed the limit in an amount of time, the processor **234** or the processor **226** indicates, e.g., highlights, etc., a time at which the level is crossed on the GUI **370**. For example, the processor **234** highlights the wake-up time **414** and the bed time **316**.

It should be noted that a GUI generated by the processor **234** is displayed on the display device **276** (FIG. **3**A), a GUI generated by the processor **302** is displayed on the display device **304** (FIG. **3**B), and a GUI generated by the processor **226** is displayed on the display device **352** (FIG. **5**).

It should further be noted that in some embodiments, any GUI described herein as being generated by the processor **234** or by the processor **226** for display may instead be generated by the processor **302** of the monitoring device **108**B for display on the display device **304**.

In some embodiments, event data includes an environmental parameter that is received from the environmental sensor **272** of the monitoring device **108**A by the processor **234** (FIG. **3**A) or from the environmental sensor **292** of the monitoring device **108**B by the processor **302** (FIG. **3**B) or from the environmental sensor **272** via the wireless communication device **278** (FIG. **3**A) of the monitoring device **108**A by the NIC **356** (FIG. **5**) of the computing device **166** or from the environmental sensor **292** via the wireless communication device **300** (FIG. **3**A) of the monitoring device **108**B by the NIC **356** (FIG. **5**) of the computing device **166**.

In several embodiments, the processor **226** or the processor **234** does not generate event data when an activity of the event data occurs for less than a period of time, e.g., two minutes, three minutes, etc.

In a number of embodiments, the processor **226** or the processor **234** replaces a current location identifier with a previous and a future location identifier when the user **112**A is at the previous, current, and future locations within a time limit and when the previous location identifier and the future location identifier are the same. The previous location is a location at which the user **112**A was before arriving at the current location. The current location is a location at which the user **112**A is before the user **112**A arrives at the future location. For example, the processor **234** determines based on the correspondence between one or more geo-locations, one or more positions of the user **112**A, and the previous location and based on the correspondence between one or more geo-locations, one or more positions of the user **112**A, and the future location that the previous location and the future location are the same.

In this example, the processor **234** further determines that the current location is different from the previous and future locations and the user **112**A has arrived at the previous, current, and future locations within a time limit that is received from the time measurement device **232**. In this example, the processor **234** determines that the current location is different from the previous locations based on the correspondence between one or more geo-locations, one or more positions of the user **112**A, and the previous location and based on the correspondence between one or more geo-locations, one or more positions of the user **112**A, and the future location and based on the correspondence between one or more geo-locations, one or more positions of the user **112**A, and the current location. In this example, the processor **234** determines that the current location is the same as the previous and future locations upon determining that the previous and future locations are the same and that the user **112**A arrives at the previous, current, and future locations within the time limit.

In several embodiments, the processor **226** or the processor **234** replaces a current activity identifier with a previous and a future activity identifier when the user **112**A performs the previous, current, and future activities within a time limit and when the previous activity identifier and the future activity identifier are the same. The previous activity is an activity that the user **112**A performs before performing the current activity and the current activity is an activity that the user **112**A performs before performing the future activity. For example, the processor **234** determines based on positions of the user **112**A and/or geo-location data of the user **112**A that the previous activity and the future activity are the same and that the current activity is different from the previous and the future activities. In this example, the processor **234** further determines that the previous, current, and future activities are performed within a time limit that is received from the time measurement device **232**. In this example, the processor **234** determines that the current activity is the same as the previous and future activities upon determining that the previous and future activities are the same and that the user **112**A performs the previous, current, and future activities within the time limit.

In some embodiments, the processor **226** or the processor **234** applies a Markov model to determine whether to replace the current location identifier that is different from the previous and future location identifiers with the previous or future location identifier. In a number of embodiments, the processor **226** or the processor **234** applies a Markov model to determine whether to replace the current activity identifier that is different from the previous and future activity identifiers with the previous or future activity identifier.

In some embodiments, a user resizes and/or repositions an overlay, e.g., an activity identifier, a location identifier, etc., to improve the precision of an event. For example, an overlay indicates that the user **112**A is performing an activity at a first activity level at a time. The user **112**A changes a position and/or size of the overlay to indicate that the user **112**A is performing the activity at a second activity level at the time. The first and second activity levels are displayed within the same GUI. The user **112**A changes a position and/or size of an overlay via an input device of the computing device **166** or via a user interface of a monitoring device.

FIG. **7**B is a diagram of a GUI **420** that is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), **210** (FIG. **6**E), or **221** (FIG. **6**F). A map **422** includes a location, e.g., an aquarium, etc., visited by the user **112**A and further includes a route to the location. The map **422** is displayed within the GUI **420**. The map **422** is generated based on geo-location data. Moreover, the GUI **420** includes a timeline **423** of activities performed by the user **112**A on a date **424** of Mar. 1, 2012. The date **424** is displayed within the GUI **420** on top of the map **422**.

The user **112**A selects the date **424** among multiple dates displayed on top of the map **422** via the user interface **274** (FIG. **3**A) of the monitoring device **108**A or via the input device **340** (FIG. **5**) of the computing device **166**. When the date **424** is selected, the processor **234** of the monitoring device **108**A (FIG. **3**A) generates the GUI **420** to display the GUI **420** on the display device **276** (FIG. **3**A) or the processor **226** (FIG. **5**) of the computing device **166** generates the GUI **420** to display the GUI **420** on the display device **352** (FIG. **5**) of the computing device **166**.

The GUI **420** includes events $\mathbf{424}_1$, $\mathbf{424}_2$, $\mathbf{424}_3$, $\mathbf{424}_4$, $\mathbf{424}_4$, $\mathbf{424}_5$, $\mathbf{424}_6$, and $\mathbf{424}_7$. The event $\mathbf{424}_4$ includes activity levels of an activity performed at the aquarium by the user **112**A.

FIG. **7**C is a diagram illustrating a method for establishing boundaries between two locations over one or more periods of time. A boundary is a boundary of a location. A boundary also indicates a time at which the user **112**A enters or exits a location having the boundary. For example, a boundary A includes outside walls of a home of the user **112**A and a time at which the user **112**A enters the home or exits the home. As another example, a boundary B includes outside walls of a building where the user **112**A works and a time at which the user **112**A enters the building or leaves the building. As yet another example, a boundary C includes outside walls of a sandwich shop and a time at which the user **112**A enters the sandwich shop or leaves the sandwich shop. As another example, a boundary D includes a line that limits an area of a golf course and a time at which the user **112**A enters the golf course or leaves the golf course. As an example, a boundary E includes a body of a vehicle and a time at which the user **112**A enters the vehicle or leaves the vehicle.

The processor **234** of the monitoring device **108**A (FIG. **3**A) or the processor **226** (FIG. **5**) of the computing device **166** determines boundaries where the user **112**A arrives at, e.g., enters, etc., and departs from, e.g., exits, etc., a location. For example, the processor **234** receives from the device locator **222** (FIG. **3**A) a geo-location **1** of the monitoring device **108**A. Continuing with the example, the processor **234** determines that the geo-location **1** corresponds to a location **1**, e.g., a street, a vehicle, etc., outside a location **2**, e.g., a building, a street, etc. The location **2** corresponds to a geo-location **2**. The processor **234** determines that the user **112**A is at the location **1** at a time tx and at the location **2** at a time ty. In this example, the processor **226** receives the geo-location **1** from the device locator **222** and the geo-location **2** from the device locator **222** and the times tx and ty from the time measurement device **232** (FIG. **3**A). In this example, there is a lack of geo-location data of the user **112**A between the times tx and ty.

In the example, the processor **234** further determines a speed of an activity of the user **112**A performed at the time tx or at the time ty. The processor **234** determines a speed of the user **112**A between the times tx and ty. Further, in this example, the processor **234** calculates speed as a ratio of a distance between the geo-locations **2** and **1** and a difference between the times ty and tx. In this example, based on the speed, the processor **226** determines an amount of time taken by the user **112**A to reach an entry of the location **2**. A geo-location corresponding to the entry of the location **2** is obtained from the device locator **222** by the processor **234** and/or an amount of movement corresponding to the entry of the location **2** is obtained from the position sensor **220** of the monitoring device **108**A, and the entry is determined from geo-location, the amount of movement, and/or the geo-location-location database by the processor **234**. In this example, the processor **234** adds the amount of time taken to reach the entry from the time tx to determine a time of entry by the user **112**A into the location **2** from the location **1**.

It should be noted that the processor **234** of the monitoring device **108**A or the processor **226** of the computing device **166** determines geo-location data as located along a straight line between two boundaries. For example, geo-location data is located on a straight line **440** between the boundary A and the boundary B, geo-location data is located on a straight line **442** between the boundary B and the boundary C, and geo-location data is located on a straight line **444** between a point **448** and the boundary D.

In some embodiments, geo-location data is determined for minute time intervals, e.g., times between the times tx and ty, every minute, every fraction of a minute, etc., is compared to the geo-location data on a straight line between two boundaries or between a boundary and a point. The processor **234** or the processor **226** performs the comparison. The geo-location data determined for the minute time intervals may be decimated by the processor **234** or the processor **226**. The processor **234** or the processor **226** determines whether a divergence between the geo-location data obtained at the minute time intervals and geo-location data on a straight line between two boundaries exceeds a value. Upon determining that the divergence exceeds the value, the processor **234** or the processor **226** determines that there is a boundary at a point of the divergence.

For example, a divergence between geo-location data on the straight line **440** and geo-location data, obtained at minute time intervals, on a curve **446** exceeds a value. In this example, the boundary A exists at a point of the divergence. On the other hand, upon determining that the divergence does not exceed the value, the processor **234** or the processor **226** determines that there is no boundary at the point of lack of divergence. For example, a divergence between geo-location data on the straight line **444** and geo-location data, obtained at minute time intervals, on a straight line **446** does not exceed the value. In this example, there is no boundary formed at the point **448** at which the lines **444** and **446** start to intersect.

FIG. **7**D is a diagram of a GUI **460** to illustrate a method of allowing a user to choose a location in case of common geo-locations between multiple locations. The GUI **460** is generated by executing the method **221** (FIG. **6**F). As shown in the GUI **460**, the processor **234** or the processor **226** determines that a location **462** and a location **464** has one or more common geo-locations **466**. The locations **462** and **464** may be determined by the processor **226** or the processor **234** based on the geo-location-location database. The processor **234** generates a prompt and displays the prompt via the display device **276** (FIG. **3**A) to the user **112**A. Similarly, the processor **226** generates the prompt to display via the display device **352** (FIG. **5**). The prompt indicates to the user **112**A to select the location **462** or the location **464** as a location corresponding to the geo-locations **466**. The user **112** selects via the user interface **274** (FIG. **3**A) or via the input device **340** (FIG. **5**) the location **462** or the location **464** as corresponding to the geo-locations **466**. Upon receiving the selection of the location **462** or the location **464**, the processor **226** or the processor **234** associates the selected location to correspond to the geo-locations **466**.

In some embodiments, the user **112**A expands a size of the location **462** via the user interface **274** (FIG. **3**A) to indicate to include one or more geo-locations within the location **466** to indicate to the processor **226** that the one or more geo-locations within the location **466** are within the location **462**. The processor **226** then associates the one or more geo-locations with the location **462** instead of with the location **466**.

In various embodiments, one or more geo-locations are located outside the location **466**. The user **112**A expands a size of the location **462** via the user interface **274** (FIG. **3**A) to indicate to include the one or more geo-locations to indicate to the processor **226** that the one or more geo-locations are within the location **462**. The processor **226** then associates the one or more geo-locations with the location **462**.

FIG. **7**E is a diagram of an embodiment of a web page **470** that includes the GUI **394** that further includes the events $\mathbf{128}_1$, $\mathbf{128}_2$, $\mathbf{128}_3$, $\mathbf{128}_4$, $\mathbf{128}_5$, and $\mathbf{128}_6$. The GUI **394** is similar to the GUI **370** (FIG. **7**A) except that the GUI **394** is displayed within the web page **470** and the GUI **394** includes a time **337** of exit by the user **112**A of his/her home. In some embodiments, the GUI **394** includes a time of entry or exit by the user **112**A of a location.

A web page is displayed when the wireless communication device **278** (FIG. **3**A) or a wired communication device of the monitoring device **108**A sends a request for the web page to the server **228** via the network **176** without using the computing device **166** (FIG. **3**A). In some embodiments, the request for a web page is sent from the NIC **356** of the computing device **166** via the network **176** to the server **228**.

Upon receiving the request for a web page, the server **228** sends the web page via the network **176** to the computing device **166**. The NIC **356** of the computing device receives a web page and the web page is displayed on the display device **352** (FIG. **5**) of the computing device **166**.

Similarly, in some embodiments, upon receiving the request for a web page, the server **228** sends the web page via the network **176** to the monitoring device **108**A. The wireless communication device **278** (FIG. **3**A) or a wired communication device of the monitoring device **108**A receives a web page and the web page is displayed on the display device **276** (FIG. **3**A) of the monitoring device **108**A.

FIGS. **7**F-**1** and **7**F-**2** are diagrams used to illustrate an embodiment of a zoom-in **496** of a portion **502** of a GUI **498**. The GUI **498** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E). In some embodiments, the zoom-in **496** is displayed on the display device **276** (FIG. **3**A) of the monitoring device **108**A or on the display device **352** (FIG. **5**) of the computing device **166**. The zoom-in **496** is displayed when the user **112**A selects the portion **502** via the user interface **274** (FIG. **3**A) or via the input device **340** (FIG. **5**).

FIGS. **7**G-**1**, **7**G-**2**, and **7**G-**3** are diagrams used to illustrate an embodiment of a daily journal GUI **510**. The daily journal GUI **510** is generated when the processor **234** or the processor **226** combines one or more GUIs **512**, **514**, **516**, and **518**. Each GUI **512**, **514**, **516**, and **518** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E). The GUIs **512**, **514**, **516**, and **518** have chronologically-ordered dates of one or more activities performed by the user **112**A at one or more locations over one or more periods of time. In some embodiments, the GUIs **512**, **514**, **516**, and **518** have consecutive dates, which are dates of activities performed by the user **112**A. The daily journal GUI **510** is displayed by the processor **234** on the display device **276** (FIG. **3**A) of the monitoring device **108**A or is displayed by the processor **226** on the display device **352** (FIG. **5**) of the computing device **166**.

Each GUI **512**, **514**, **516**, and **518** is displayed in a row. In some embodiments, each GUI **512**, **514**, **516**, and **518** is displayed in a column or parallel to an oblique line.

FIG. **7**H is a diagram of an embodiment of a daily journal GUI **520**. The daily journal GUI **520** is generated when the processor **234** or the processor **226** combines one or more GUIs **522**, **524**, **526**, and **528**. Each GUI **522**, **524**, **526**, and **528** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E). The GUIs **522**, **524**, **526**, and **528** have chronologically-ordered dates of one or more activities performed by the user **112**A at one or more locations over one or more periods of time. In some embodiments, the GUIs **522**, **524**, **526**, and **528** have consecutive dates, which are dates of activities performed by the user **112**A. The daily journal GUI **520** is displayed by the processor **234** on the display device **276** (FIG. **3**A) of the monitoring device **108**A or is displayed by the processor **226** on the display device **352** (FIG. **5**) of the computing device **166**.

Each GUI **522**, **524**, **526**, and **528** is displayed in an orderly fashion.

FIG. **7**I is a diagram of an embodiment of a GUI **530** that provides an overview of one or more activities **538** performed by the user **112**A at one or more locations **540** over a period of time. In some embodiments the activities **538** are graphical elements. Similarly, in these embodiments, the locations **540** are graphical elements. The GUI **530** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E). The GUI **530** also includes a time line **542**, which is an example of a graphical element, that shows a relationship of time periods, e.g., a night time period, a day time period, etc., with performance of the activities **538** and the locations **540**. For example, a time identifier **860** indicates a night time at which a sedentary activity $\mathbf{546}_1$ is performed by the user **112**A within a home of the user **112**A. In this example, the home of the user **112**A is identified by a location/activity identifier $\mathbf{544}_1$. As another example, a time identifier **862** identifies a day time at which a lightly active activity $\mathbf{536}_2$ and a sedentary activity $\mathbf{546}_3$ are performed by the user **112**A. In this example, the lightly active activity $\mathbf{536}_2$ and the sedentary activity $\mathbf{546}_3$ are performed at an office of the user **112**A. The office is identified by a location/activity identifier $\mathbf{544}_3$.

The activities **538**, the locations **540**, and the time line **542** are aligned with respect to each other along a column **550**. The locations **540** include one or more location/activity identifiers $\mathbf{544}_1$, $\mathbf{544}_2$, $\mathbf{544}_3$, and $\mathbf{544}_4$.

The activities **538** include the sedentary activity $\mathbf{546}_1$, a sedentary activity $\mathbf{546}_2$, the sedentary activity $\mathbf{546}_3$, a sedentary activity $\mathbf{546}_4$, a sedentary activity $\mathbf{546}_4$, a sedentary activity $\mathbf{546}_5$, a sedentary activity $\mathbf{546}_6$, a sedentary activity $\mathbf{546}_7$, and a sedentary activity $\mathbf{546}_8$. The activities **538** further include a lightly active activity 536_1, the lightly active activity 536_2, a lightly active activity 536_3, a lightly active activity 536_4, a lightly active activity 536_5, a lightly active activity 536_6, and a lightly active activity 536_7. The activities **538** further includes a moderately active activity 534_1, a moderately active activity 534_2, a moderately active activity 534_3, and a highly active activity **532**.

It should be noted that an activity level of the sedentary active activity is lower than an activity level of the lightly active activity. An activity level of the lightly active activity is lower than an activity level of the moderately active activity and an activity level of the moderately active activity is lower than an activity level of the highly active activity. For example, a number of calories burned during the sedentary active activity is lower than a number of calories burned during the lightly active activity, a number of calories burned during the lightly active activity is lower than a number of calories burned during the moderately active activity, and a number of calories burned during the moderately active activity is lower than a number of calories burned during the highly active activity. As another example, an amount of activity performed at the sedentary active activity is lower than an amount of activity performed at the lightly active activity, an amount of activity performed at the lightly active activity is lower than an amount of activity performed at the moderately active activity, and an amount of activity performed at the moderately active activity is lower than an amount of activity performed at the highly active activity.

Each activity is associated, e.g., aligned, grouped, etc., with a location and a time period. For example, the sedentary activity 546_1 is grouped with the location 544_1 and with the time identifier **860**. As another example, the lightly active activity 536_1 is aligned with the locations 544_1 and 544_2 and with the time identifier **862**. In some embodiments, an alignment between two graphical elements may be in any direction, e.g., vertical, horizontal, oblique, etc. The association between an activity, a location at which the activity is performed, and a time period during which the activity is performed may be indicated by a common graphical element, e.g., a common color, common text, a common texture, a common image, a common animation, a common icon, a common background, etc., of the activity, the location, and the time period.

In some embodiments, when an activity is associated, e.g., grouped, aligned vertically, aligned horizontally, color coded, text associated, aligned in a general associated display screen area, etc. with a location, the activity is said to have been performed at the location. In one embodiment, vertical or horizontal or oblique alignment is not used, but other ways to associate the activity to a location and a time period during which the activity is performed at the location can be used.

Moreover, it should be noted that although four activities are shown in FIG. **7**I, in some embodiments, any number of activities may be shown. Furthermore, in some embodiments, the activities **538**, the locations **540**, and the time line **542** are aligned with respect to each other along a row instead of the column **550**. For example, each of the activities **538**, the locations **540**, and the time line **542** are made vertical instead of horizontal to be aligned with respect to each other along a row.

A cursor **552** is displayed on the GUI **530** by the processor **226** or by the processor **234**. When the user **112**A uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to a portion of the activities **538** and selects the portion, a progressively detailed GUI **560** is displayed. The GUI **560** is displayed in FIG. **7**J.

FIG. **7**J is a diagram of an embodiment of the GUI **560**. The GUI **560** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E). The GUI **560** includes a detailed view of the activities **538** (FIG. **7**I). The detailed view is shown as activities **580**. For example, the GUI **560** includes a detailed view of each activity level of the GUI **530** (FIG. **7**I). To illustrate, the highly active activity **532** (FIG. **7**I) is detailed as one or more highly active activity levels 582_1 and 582_2 of the activity. As another illustration, the sedentary activities 546_1 thru 546_8 are detailed as one or more sedentary activity levels 562_1, 562_2, 562_3, 562_4, 562_5, 562_6, 562_7, and 562_8. As yet another illustration, the lightly active activities 536_1 thru 536_7 are detailed as one or more lightly active activity levels 564_1, 564_2, 564_3, 564_4, 564_5, 564_6, 564_7, and 564_8. As another illustration, the moderately active activities 534_1 thru 534_3 are detailed as one or more moderately active activity levels 566_1, 566_2, 566_3, and 566_4. In some embodiments the activities **580** are graphical elements. The activities **580** are displayed along a timeline **581**.

In some embodiments, each location/activity identifier of the GUI **530** is detailed by the processor **226** or by the processor **234** into a detailed location/activity identifier within the GUI **560**. For example, a building identifier within the GUI **530** is detailed, within the GUI **560** into one or more rooms of the building when the user **112**A uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to a portion of the locations **540** (FIG. **7**I) and to select the portion.

In various embodiments, the GUI **560** includes a detailed view, which includes one or more activity levels, of an activity of the GUI **530**. The activity of the GUI **530** is one at which the user **112**A points to and selects with the pointer **552**. In some embodiments, the GUI **560** includes a detailed location/activity identifier of a location/activity identifier, on the GUI **530**, at which the user **112**A points to and selects with the pointer **552**.

FIG. **7**K is a diagram of an embodiment of the GUI **574**. The GUI **574** is the same as the GUI **560** (FIG. **7**J) except that the GUI **574** shows a more detailed view of one or more activities performed by the user **112**A, of a time period during which the activities are performed, and/or of a location at which the activities are performed, compared to that shown in the GUI **560**. For example, when the user **112**A uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to a portion, e.g., an activity level 582_1 (FIG. **7**J), etc., of the activities **580** (FIG. **7**J) and to select the portion, a detailed view of the portion is displayed within the GUI **574**. To illustrate, the detailed view of the portion includes a graphical element **588** that displays a time at which the activity level 582_1 occurs, a location/activity identifier **590** identifying, e.g., highlighting, etc., an activity, e.g., walking, running, etc., performed at a location by the user **112**A. The activity level 582_1 and an activity level 582_2 are portions of an activity level **582**.

The detailed view further includes text **592** that describes the activity, having the activity level 582_1, performed by the user **112**A, time of occurrence of the activity, and activity data, e.g., number of steps, calories burned, etc., of the activity. The detailed view further includes a location/activity identifier **594** that represents, e.g., highlights, etc., a location closest to a location of performance of the activity identified by the location/activity identifier **590**. For example, the location/activity identifier **594** is a home icon of a home of the user **112**A and the home is at a location closest to a location where the user **112**A walks a dog. The detailed view further includes text **596** describing a location identified by the location/activity identifier **594**. The graphical element **588**, the location/activity identifier **590**, and the location/activity identifier **594** are aligned along a line **598**. In some embodiments, the graphical element **588**, the location/activity identifier **590**, and the location/activity identifier **594** are not aligned with respect to each other. In various embodiments, the detailed view excludes the text **592** and/or excludes the text **596**. In several embodiments, the detailed view excludes the location/activity identifier **590** and/or excludes the location/activity identifier **596**. The GUI **574** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E).

FIG. **7**L is a diagram illustrating an embodiment of a method of combining activity levels over a period of time. The method of combining activity levels over a period of time is performed by the processor **226** or by the processor **234**. In the method of combining activity levels, a GUI **602** is displayed by the processor **226** or by the processor **234**.

The GUI **602** includes a display $\mathbf{604}_1$ of activity levels of a number of activities, e.g., an activity **1**, an activity **2**, and an activity **3**, etc. performed by the user **112**A during a day **1**. The activities shown in the display $\mathbf{604}_1$ are performed in the order shown. For example, the activity **1** is performed during the day **1** before the activity **2** is performed during the day **1** and the activity **2** is performed during the day **1** before the activity **3** is performed during the day **1**.

Moreover, the GUI **602** includes a display $\mathbf{604}_2$ of activity levels of a number of activities, e.g., an activity **2**, an activity **1**, and an activity **3**, etc. performed by the user **112**A during a day **2**. The activities shown in the display $\mathbf{604}_2$ are performed in the order shown. For example, the activity **2** is performed during the day **2** before the activity **1** is performed during the day **2** and the activity **1** is performed during the day **2** before the activity **3** is performed during the day **2**.

The user **112**A uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to the activity **1** performed during the day **1** to select the activity **1** performed during the day **1** and drag the activity **1** performed during the day **1** to a GUI **606**, which is an activity filter. The user **112**A then uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to the activity **1** performed during the day **2** to select the activity **1** performed during the day **2** and drag the activity **1** performed during the day **2** to the GUI **606**. In some embodiments, the processor **226** or the processor **234** receives a selection from the user **112**A via the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) of the activity **1**, the activity **2**, or the activity **3** over a period of time, e.g., day **1**, day **2**, etc., within the GUI **602** and the processor **234** drags the activities performed during the period of time to present in the GUI **606**.

When the user **112**A uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to the activity **1** performed during the day **1** within the GUI **606** and selects the activity **1** performed during the day **1** or to point the cursor **552** to the activity **1** performed during the day **2** and selects the activity **1** performed during the day **2** within the GUI **606**, a GUI **608** is generated and displayed. The GUI **608** includes an aggregate, e.g., total, etc., activity level **609** of the activity **1** performed during the day **1** and includes an aggregate activity level **610** of the activity **1** performed during the day **2**. Any aggregation of activity levels is performed by the processor **226** or by the processor **234**.

In some embodiments, upon receiving the selection of the activity **1**, the activity **2**, or the activity **3** over a period of time, e.g., day **1**, day **2**, etc., within the GUI **602**, the processor **226** or the processor **234** generates a GUI, e.g., the GUI **608**, having aggregate activity levels of the activity over the period of time for which the activity is selected.

FIG. **7**M is a diagram of an embodiment of a GUI **614** that describes an aggregate level of one or more activities performed by the user **112**A over a period of time. The processor **226** or the processor **234** determines an aggregate amount of an activity performed by the user **112**A over a period of time. The processor **234** or the processor **234** generates a simplified description of the aggregate amount of the activity and displays the simplified description on a corresponding display device. For example, when the user **112**A selects a tab **616** via the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**), simplified descriptions **620**, **622**, and **624** are displayed within the GUI **614** for one or more periods of time. The simplified description **620** is of activities performed by the user **112**A on Thursday, March 1, the simplified description **622** is of activities performed by the user **112**A on Friday, March 2, and the simplified description **624** is of activities performed by the user **112**A on Saturday, March 3.

Each simplified description of activities performed during a period of time is displayed besides a corresponding sequence of events occurring during the period of time. For example, the simplified description **620** of activities performed on Thursday, March 1 is displayed besides one or more events **626** occurring on Thursday, March 1.

FIG. **7**N is a diagram of an embodiment of a pie-chart **650** of locations at which the user **112**A performs one or more activities and of percentages of activity levels at the locations over a period of time. The period of time is represented by the pie-chart **650**. The pie-chart **650** is generated by the processor **226** or the processor **234**.

The pie-chart **650** is segmented into a location **652**, a location **654**, a location **656**, an activity **658**, an activity **660**, an activity **662**, and a location/activity **664**. When the user **112**A is at the location **652**, the user **112**A has an activity level of **666**. Similarly, when the user **112**A is at the location **654**, the user **112**A has an activity level of **668**. When the user **112**A is at the location **656**, the user **112**A has an activity level of **670**. Moreover, when the user **112**A is performing the activity **658**, the user **112**A has an activity level of **672**. When the user **112**A is performing the activity **660**, the user **112**A has an activity level of **674**. Also, when the user **112**A is performing the activity **662**, the user **112**A has an activity level of **676**. When the user **112**A is performing the activity **664** or is at the location **664**, the user **112**A has an activity level of **678**.

In some embodiments, an activity level of an activity performed at a location by the user **112**A is determined by the processor **226** or the processor **234** in terms of a percentage of an amount of activity that would have been performed at the location. For example, the processor **226** or **234** determines that a maximum amount of activity that can be performed by the user **112**A or any other user at the location **652** is n. The processor **226** or **234** receives an amount of activity actually performed by the user **112**A as m. The processor **226** or **234** determines a percentage $(m/n)\times 100$ as the activity level **666**.

In various embodiments, any other type of graph, e.g., a bar graph, a line graph, etc., is generated by the processor **226** or the processor **234** instead of a pie chart.

FIG. 7O is a diagram of an embodiment of a GUI **690** that includes an overlay of a map **692** on one or more locations **696**, **698**, and **700** that the user **112**A visits during a period of time to perform one or more activities **701**, **702**, **704**, and **708** performed by the user **112**A during the period of time. The GUI **690** is generated by the processor **226** or by the processor **234**. The GUI **690** is generated by executing the method **221** (FIG. **6**F).

The GUI **690** includes a map **692** of a path traveled by the user **112**A during a period of time, text describing the locations **696**, **698**, and **700** and text describing the activities **701**, **702**, **704**, and **708**.

In some embodiments, instead of text describing the locations **696**, **698**, and **700**, one or more graphical elements or a combination of the graphical elements and text describing the locations are used within the GUI **690** to indicate the locations. In various embodiments, instead of text describing the activities **701**, **702**, **704**, and **708**, one or more graphical elements or a combination of the graphical elements and text describing the activities are used within the GUI **690** to indicate the activities.

In a number of embodiments, the one or more locations **696**, **698**, and **700** are overlaid on the map **692**.

FIG. 7P is a diagram of an embodiment of a web page **714** that illustrates that a map **732** is overlaid on the event region **730** to indicate a geo-location of the user **112**A at a time, e.g., an hour, a minute, etc., within a time period in which the user **112**A performs one or more activities. For example, the processor **234** overlays the map **732** on activity levels within the event region **730**, on a timeline within the event region **730**, on a background within the event region **730**, and on location/activity identifiers within the event region **730**.

The web page **714** includes a GUI **716** that further includes the map **732** and the event region **730**. When the user **112**A selects a time, e.g., 11 AM, NOON, 1 PM, etc., on the GUI **370** (FIG. **7**A) via the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**), a map, e.g., the map **732**, etc., is overlaid by the processor **226** or the processor **234** on the GUI **370** to indicate a geo-location of the user **112**A at the time. For example, the geo-location is indicated by centering the map at the geo-location of the user **112**A at the time.

The GUI **716** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E) in combination with the method **221** (FIG. **6**F).

In some embodiments, the event region **730** is overlaid on the map **732**.

In a number of embodiments, activity levels of a GUI are of a different dimension than that of a timeline of the GUI, or a location/activity identifier of the GUI, or a background of the GUI, or a combination thereof. For example, activity levels of a GUI are three-dimensional, and a location/activity identifier of the GUI or a background of the GUI are two-dimensional. As another example, activity levels of a GUI are two-dimensional, and a location/activity identifier of the GUI or a background of the GUI are three-dimensional. An example of a different dimension of activity levels compared to that of a location/activity identifier is shown above in FIG. **7**M.

FIG. 7Q is a diagram of an embodiment of a GUI **750** that includes a map **752** below an event region **754**. The GUI **750** is generated by the processor **226** or the processor **234**. The event region **754** includes one or more location/activity identifiers **754**$_1$, **754**$_2$, **754**$_3$, **754**$_4$, **754**$_5$, and **754**$_6$ of locations visited by the user **112**A on a route **880** during a period of time. Moreover, the event region **754** includes graphical elements and/or text that represent one or more activities **756**$_1$, **756**$_2$, **756**$_3$, **756**$_4$, and **756**$_5$ performed by the user **112**A during the period of time. In one embodiment, one or more of the activity **756**$_1$, **756**$_2$, **756**$_3$, **756**$_4$, and **756**$_5$ is associated with a location/activity identifier. The event region **754** includes activity levels **870**, **872**, and **874** of activities performed by the user **112**A during the route **880**. The activity level **872** is of one or more activities performed by the user **112**A when the user **112**A is at a location identified by the location/activity identifier **754**$_1$. Moreover, the activity level **874** is of an activity of walking performed by the user **112**A when the user **112**A is at a location identified by the location/activity identifier **754**$_2$.

The GUI **750** further includes links **758**$_1$, **758**$_2$, **758**$_3$, **758**$_4$, **758**$_5$, **758**$_6$, **758**$_7$, **758**$_8$, and **758**$_9$ between a set including one or more geo-locations **760**$_1$, one or more geo-locations **760**$_2$, one or more geo-locations **760**$_3$, one or more geo-locations **760**$_4$, one or more geo-locations **760**$_5$, and one or more geo-locations **760**$_6$ on the map **752** and a set including one or more of the location/activity identifiers **754**$_1$, **754**$_2$, **754**$_3$, **754**$_4$, **754**$_5$, and **754**$_6$ and/or one or more of the activities **756**$_1$, **756**$_2$, **756**$_3$, **756**$_4$, and **756**$_5$. For example, the link **758**$_1$ is established between the geo-location **760**$_1$ and the location **754**$_1$.

Each of one or more geo-locations **760**$_1$, one or more geo-locations **760**$_2$, one or more geo-locations **760**$_3$, one or more geo-locations **760**$_4$, one or more geo-locations **760**$_5$, and one or more geo-locations **760**$_6$ is represented as a graphical element on the route **880**. The route **880** connects the one or more geo-locations **760**$_1$ with the one or more geo-locations **760**$_5$. The route **880** is displayed on the map **752**.

The GUI **750** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E) in combination with the method **221** (FIG. **6**F).

In some embodiments, a geo-location is represented as a graphical element and/or as text by the processor **226** or by the processor **234**.

In some embodiments, the map **752** is placed by the processor **236** or the processor **234** at any other place, e.g., above, to the left of, to the right of, etc., with respect to the event region **754**.

In several embodiments, the map **752** is of a different dimension than that of graphical elements that include the activity levels **870**, **872**, and **874**, or the location/activity identifiers **754**$_1$, **754**$_2$, **754**$_3$, **754**$_4$, **754**$_5$, **754**$_6$, **756**$_1$, **756**$_2$, **756**$_3$, **756**$_4$, and **756**$_5$, or the route **880**, or a combination thereof.

In some embodiments, a route is generated by the processor **234** based on geo-location data, position, or a combination thereof.

FIG. 7R is a diagram of an embodiment of a web page **770** that is used to illustrate an overlay of event data on a map **774**. A map is accessed by the processor **234** of the monitoring device **108**A via the wireless communication device **278** (FIG. **3**A) or a wired communication device of the monitoring device **108**A and the network **176** (FIG. **3**A) from the geo-location-location database of the server **228** (FIG. **3**A) or another server without using the computing device **166** (FIG. **3**A). In some embodiments, the map **774** is accessed by the processor **234** of the monitoring device **108**A via the wireless communication device **278** (FIG. **3**A) or a wired communication device of the monitoring device **108**A, the computing device **166**, and the network **176** (FIG. **3**A) from the geo-location-location database of the server

228 (FIG. 3A) or another server. In a number of embodiments, the map **774** is accessed by the processor **226** of the computing device **166** via the NIC **356** (FIG. **5**) of the computing device **166** and via the network **176** (FIG. **3**A) from the geo-location-location database of the server **228** (FIG. **3**A) or another server.

The web page **770** includes a GUI **772** that is displayed by the processor **226** or the processor **234**. The GUI **772** is generated by the processor **226** or the processor **234**. The GUI **772** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E) in combination with the method **221** (FIG. **6**F).

The map **774** includes one or more geo-locations, names of landmarks accessed from the geo-location-location database, names of public places accessed from the geo-location-location database, names of streets accessed from the geo-location-location database, names of geo-locations accessed from the geo-location-location database, or a combination thereof, etc.

The event data is overlaid on the map **774** by the processor **226** or by the processor **234**. The event data includes one or more of a location/activity identifier 776_1, e.g., a home identifier, etc., a location/activity identifier 776_2, e.g., an identifier of a bus, etc., a location/activity identifier 776_3, e.g., an identifier of a railway station, etc., a location/activity identifier 776_4, e.g., a vehicle identifier, etc., a location/activity identifier 776_5, e.g., a work location/activity identifier, etc., of locations visited by the user **112**A during a period of time and an activity identifier 778_1 of an activity, e.g., walking, etc., performed by the user **112**A during the period of time. The event data further includes a path **780**, e.g., a route, etc., taken by the user **112**A during the period of time in visiting the locations having the location/activity identifiers 776_1, 776_2, 776_3, 776_4, and 776_5 and in performing an activity, e.g., walking, etc., represented by the activity identifier 778_1. The route **780** is generated based on geo-location and/or position of the monitoring device **108**A.

In some embodiments, the event data includes activity data of any number of activities performed by the user **112**A.

In several embodiments, the map **774** is overlaid on top of, e.g., in front of, etc., the event data. In various embodiments, the event data is overlaid on top of the map **774**.

In various embodiments, the activity identifier 778_1, the path **780**, and/or the location/activity identifiers 776_1, 776_2, 776_3, 776_4, and 776_5 are color-coded by the processor **226** or the processor **234**. For example, the processor **226** or the processor **234** assigns a different color to the identifier 778_1 than to one or more of the location/activity identifiers 776_1, 776_2, 776_3, 776_4, and 776_5, and the path **780**. As another example, the processor **226** or the processor **234** assigns a different color to the location/activity identifier 776_1 than to one or more of the location/activity identifiers 776_2, 776_3, 776_4, and 776_5. As another example, the processor **226** or the processor **234** assigns a different color to the path **780** than to one or more of the location/activity identifiers 776_1, 776_2, 776_3, 776_4, and 776_5. In some embodiments, the location/activity identifiers 776_1, 776_2, 776_3, 776_4, 776_5, and 778_1 are parts of the path **780**.

In some embodiments, the activity identifier 778_1, the path **780**, and/or the location/activity identifiers 776_1, 776_2, 776_3, 776_4, and 776_5 are coded by the processor **226** or the processor **234** by using graphical properties. For example, the processor **226** or the processor **234** assigns a different graphical property to the activity identifier 778_1 than to one or more of the location/activity identifiers 776_1, 776_2, 776_3, 776_4, and 776_5, and the path **780**. As another example, the processor **226** or the processor **234** assigns a different graphical property to the location/activity identifier 776_1 than to one or more of the location/activity identifiers 776_2, 776_3, 776_4, and 776_5. As another example, the processor **226** or the processor **234** assigns a different graphical property to the path **780** than to one or more of the location/activity identifiers 776_1, 776_2, 776_3, 776_4, and 776_5

FIG. 7S is a diagram of an embodiment of the web page **770** that is used to illustrate a zoom-in **790** of a portion of the map **774** and of event data of an event that occurs at the portion. When the user **112**A uses the uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to the activity identifier 778_1, the processor **226** or the processor **234** generates the zoom-in **790** to display the zoom-in **790**. In some embodiments, a zoom-in is an example of a GUI.

The zoom-in **790** includes a detailed display **792** associated with the activity identifier 778_1 of an activity performed by the user **112**A at one or more geo-locations close to, e.g., within a vicinity of, within a radius of, etc., a location having the location/activity identifier 776_5. The detailed display **792** includes parameters associated with an activity performed by the user **112**A, e.g., a distance traveled by the user **112**A close to a location having the location/activity identifier 776_5, a number of steps taken by the user **112**A close to the location, etc., and a textual description of an activity class, e.g., walking, running, sleeping, exercising, playing sports, sedentary, inactive, active, etc., that is identified by the activity identifier 778_1 and that is close to, e.g., with a radius of, etc., the location.

In some embodiments, the zoom-in **790** includes any other activity data, e.g., a number of calories burned by the user **112**A close to a location having the location/activity identifier 776_5, an amount of golf swings taken by the user **112**A close to the location, etc.

FIG. 7T is a diagram of an embodiment of a web page **751** that includes a GUI **759**. The GUI **759** includes an overlay of a map **753** on a user's path **755**. The user's path **755** is a path traveled by the user **112**A during a period of time. The user's path **755** is coded to distinguish various locations and/or activities along the user's path **755**. For example, a bus station is provided a different color by the processor **234** or by the processor **226** than that provided to a railway station. As another example, a walking activity of the user **112**A along the user's path **755** is provided a different shade, text, and/or color by the processor **234** or by the processor **226** than that provided to a running activity of the user **112**A along the user's path **755**. The GUI **759** is generated by executing the method **102** (FIG. **6**A), **160** (FIG. **6**B), **170** (FIG. **6**C), or **210** (FIG. **6**E) in combination with the method **221** (FIG. **6**F).

In some embodiments, the user's path **755** is overlaid on the map **753**.

FIG. 7U is a diagram of an embodiment of a zoom-in **757** that includes a zoom-in of a portion of the user's path **755**. The zoom-in **757** is generated when the user **112**A points the cursor **552** (FIG. 7I) on a portion of the user's path **755** and selects the portion. The zoom-in **757** is of the portion of the user's path **755**. The zoom-in **757** includes activity data, e.g., number of steps walked by the user **112**A within the portion, a distance covered by the user **112**A within the portion, and a type of activity, e.g., walking, running, etc., performed by the user **112**A within the portion.

FIG. 7V is a diagram of an embodiment of the GUI **759** except that the GUI **759** indicates that a portion of the user's path **758** at which the user **112**A takes bus to a train is coded differently than a portion of the user's path **758** at which the user **112**A is traveling to work on a train and differently than a portion of the user's path **758** where the user **112**A is walking around near his/her office.

FIG. **8** is a diagram of an embodiment of one or more location/activity identifiers $\mathbf{802}_1$, $\mathbf{802}_2$, and $\mathbf{802}_3$, and one or more activity identifiers $\mathbf{804}_1$, $\mathbf{804}_2$, and $\mathbf{804}_3$. Each identifier $\mathbf{802}_1$, $\mathbf{802}_2$, $\mathbf{802}_3$, $\mathbf{804}_1$, $\mathbf{804}_2$, and $\mathbf{804}_3$ includes a pointer. For example, the identifier $\mathbf{802}_1$ includes a pointer **806**. In some embodiments, each identifier excludes a pointer.

FIG. **9** is a diagram of an embodiment of a GUI **932** that is displayed on a display device **933**. The display device **933** is an example of the display device **276** of the monitoring device **108**A (FIG. **3**A), the display device **304** (FIG. **3**B) of the monitoring device **108**B, or the display device **352** (FIG. **5**) of the computing device **166**.

A GUI can be represented or adjusted for form factor depending on a display screen of a target device. In some embodiments, the form factor of a display screen controls the format of element of a GUI. For instance, small screens that are worn on a wrist may require different GUI content orientation, placement, or filtering. For larger screens, such as those on desktops, laptops, televisions, etc., the content of the GUI can be richer, include more styling, or additional information, while still providing a GUI with location/activity identifiers.

The GUI **932** is generated when a method is executed by the processor **234** of the monitoring device **108**A (FIG. **3**A), the processor **302** (FIG. **3**B) of the monitoring device **108**B, the processor **226** of the computing device **166** (FIG. **5**), or the processor **190** (FIG. **2**A) of the server **228**.

The GUI **932** includes activities **906**, **908**, and **910**, which are represented using one or more graphical elements. Each activity **906**, **908**, and **910** includes one or more activity levels captured by the monitoring device **108**A or **108**B. For example, the activity **906** includes activity levels **902** and **904**.

In some embodiments, an activity is determined, e.g., captured, etc., by a monitoring device when a position and/or geo-location of the monitoring device is determined by the monitoring device and a location and/or an activity performed by the monitoring device is determined based on the position and/or geo-location. A monitoring device is usable by a user to perform the capturing of an activity. In one example, the monitoring device **108**A is worn by the user **112**A and the monitoring device **108**B is one on which the user **112**A stands.

The GUI **932** includes a timeline **912** that further includes a time period **914** along which the activities **906**, **908**, and **910** are performed. The timeline **912** includes a chronological order, e.g., a consecutive order, a continuous order, etc., of time within the time period **914**. For example, the timeline **912** includes all times between 8 AM on a day and 12 AM on a next day in hourly time intervals, or in time intervals of minutes, or time intervals of seconds.

Examples of a time period include a portion of an hour, a portion of a day, or a portion of a month, or a portion of a year, or a portion of a number of years.

The GUI **932** further includes the activity identifier **132**D, e.g., an activity symbol, etc., for the activity **906** performed during the time period **914**. The activity identifier **132**D includes an image **916**, and the activity identifier **132**D and the image **916** are graphically overlaid on the activity **906**. For example, the activity identifier **132**D that represents an activity of golfing covers opaquely or translucently or transparently a portion of the activity **906** of golfing performed during the time period **914**. As another example, the image **916** that includes a person golfing with a golf club covers opaquely or translucently or transparently a portion of the activity **906**.

The GUI **932** includes the location identifier **132**A, a location identifier **918**, and a location identifier **920**. The location identifier **918** identifies a location **926** at which the activity **906** identified by the activity identifier **132**D is performed. Moreover, the location identifier **920** identifies a location **928** at which the activity **908** identified by the activity identifier **132**B is performed.

In some embodiments, each location identifier includes an image, text, or a combination thereof. For example, the location identifier **918** includes an image **922**. As another example, the location identifier **920** includes an image of a tree.

In various embodiments, each location identifier is overlaid on a corresponding graphical element representing a location associated with an activity that is performed at the location. For example, the location identifier **918** and the image **920** that represent a golf course are graphically overlaid on the location **926** for the golf course. As another example, the location identifier **920** that includes an image of a tree covers opaquely or translucently or transparently a portion of the location **928** that represents the park. As yet another example, the location identifier **132**A that represents a home of the user **112**A includes an image of a house that covers opaquely or translucently or transparently a location **930** that represents the home. It should be noted that each location **926**, **928**, and **930** is represented in the form of a graphical element.

The activity **906**, the location **926** and a portion of the timeline **912** that includes the time period **914** are parts of event data **970**. Moreover, the activity **908**, the location **928** and a portion of the timeline **912** are parts of event data **972**. Also, the activity **910**, the location **930** and a portion of the timeline **912** are parts of event data **974**.

In various embodiments, data that includes the activities **906**, **908**, and **910**, the locations **926**, **928**, and **930**, the timeline **912**, the activity identifiers **132**D and **132**B, and the location identifiers **918**, **920**, and **132**A are transferred to a computing device for display. For example, the data is transferred from the NIC **254** of the server **166** (FIG. **5**) via the network **176** to the NIC **356** of the computing device **166**, or is transferred from the NIC **254** of the server **166** (FIG. **5**) via the network **176** to the wireless communication device **278** (FIG. **3**A) of the monitoring device **108**A or to a wired communication device of the monitoring device **108**A, or is transferred from the NIC **254** of the server **166** (FIG. **5**) via the network **176** to the wireless communication device **300** (FIG. **3**B) of the monitoring device **108**B or to a wired communication device of the monitoring device **108**B. As another example, the data is transferred from the wireless communication device **224** of the computing device **166** to the wireless communication device **278** of the monitoring device **108**A or to the wireless communication device **300** of the monitoring device **108**B. As yet another example, the data is transferred from a wired communication device of the computing device **166** to a wired communication device of the monitoring device **108**A or to a wired communication device of the monitoring device **108**B

In some embodiments, activity levels within the GUI **932** are generated in a manner similar to that of generating activity levels of the GUI **560** (FIG. **7**J) from the GUI **530** (FIG. **7**I). For example, the activity levels **902** and **904** are generated when the user **112**A uses the user interface **274** (FIG. **3**A) or the input device **340** (FIG. **5**) to point the cursor **552** to a portion of the activities **538** (FIG. **7**I).

In several embodiments, an activity identifier and/or a location identifier are generated when the activity level **902** or **904** is selected in a manner similar to that of the generating the activity identifier **590** and/or the location identifier **594** (FIG. **7**K) when the activity level 582_1 of the GUI **560** (FIG. **7**J) is selected.

In some embodiments, the processor **234** filters out the activity levels **902** and **904** to remove the activity levels **902** and **904**. When activity levels are removed, a chronological order in which the activity levels are shown for an activity that occurs during the time period **914** is broken.

FIG. **10** is a flowchart of an embodiment of a method **950** for displaying an action identifier in a GUI. The method **950** is executed by the processor **226** of the monitoring device **108**A (FIG. **3**A), or the processor **302** (FIG. **3**B) of the monitoring device **108**B, or by the processor **234** of the computing device **166** (FIG. **5**), or by the processor **190** (FIG. **2**A) of the server **228**.

The method **950** includes obtaining, in an operation **952**, position and/or geo-location of a monitoring device. For example, the position sensor **220** (FIG. **3**A) of the monitoring device **108**A determines a position of the monitoring device **108**A and a position sensor of the monitoring device **108**B determines a position of the monitoring device **108**B. Moreover, the device locator **222** (FIG. **3**A) of the monitoring device **108**A determines a geo-location of the monitoring device **108**A and the device locator **306** (FIG. **3**B) of the monitoring device **108**B determines a geo-location of the monitoring device **108**B.

In some embodiments, the position and/or the geo-location obtained in the operation **952** are sent from the wireless communication device **278** of the monitoring device **108**A or from the wireless communication device **300** of the monitoring device **108**B to the wireless communication device **224** (FIG. **5**) of the computing device **166**. In several embodiments, the position and/or the geo-location obtained in the operation **952** are sent from a wired communication device of the monitoring device **108**A or from a wired communication device of the monitoring device **108**B to a wired communication device of the computing device **166**. In a number of embodiments, the position and/or the geo-location obtained in the operation **952** are sent from the wireless communication device **278** of the monitoring device **108**A or from the wireless communication device **300** of the monitoring device **108**B via the network **176** to the NIC **254** of the server **228** (FIG. **2**A). In a number of embodiments, the position and/or the geo-location obtained in the operation **952** are sent from a wired communication device of the monitoring device **108**A or from a wired communication device of the monitoring device **108**B via the network **176** to the NIC **254** of the server **228** (FIG. **2**A).

The processor **226**, **234**, **302**, or **190** parses, in an operation **954** the position and/or the geo-location obtained in the operation **952**. For example, the processor **226** analyzes the position and/or the geo-location to determine the position and/or the geo-location.

The processor **226**, **234**, **302**, or **190** compares, in an operation **956**, the parsed position and/or the parsed geo-location to a set of rules within a rule database **962** (FIG. **2**B). In some embodiments, the processor **226** controls the rule database **962** to access the geo-location-location database to determine whether the parsed geo-location corresponds to a location within the geo-location-location database. In a number of embodiments, the processor **226** controls the rule database **962** to determine an activity that corresponds to the parsed position and/or the parsed geo-location. For example, as described above, when the user **112**A wearing the monitoring device **108**A is traveling at a speed greater than s_2 miles per hour and a number of steps taken by the user **112**A is greater than ss_1 per hour, the user **112**A is running. The activity of running corresponds to the number of steps and/or the speed.

The processor **226**, **234**, **302**, or **190** identifies, in an operation **958**, with an activity identifier the activity determined by applying the set of rules. For example, the processor **226** identifies the activity of walking with the activity identifier **132**B (FIG. **9**). As another example, the processor **226** identifies the activity of golfing with the activity identifier **132**D (FIG. **9**).

The processor **226**, **234**, **302**, or **228** overlays an activity identifier determined in the operation **958** on a GUI. For example, the activity identifier **132**D and the activity identifier **132**B are overlaid within the GUI **932** (FIG. **9**).

FIG. **11** is a flowchart of an embodiment of a method **970** for displaying a location identifier in a GUI. The method **970** is executed by the processor **226** of the monitoring device **108**A (FIG. **3**A), or the processor **302** (FIG. **3**B) of the monitoring device **108**B, or by the processor **234** of the computing device **166** (FIG. **5**), or by the processor **190** of the server **228**.

The method **970** includes performing the operations **952** and **954**. The processor **226**, **234**, **302**, or **190** compares, in an operation **976**, the parsed position and/or the parsed geo-location to the set of rules within the rule database **962** (FIG. **2**B). In some embodiments, the processor **226** controls the rule database **962** to access the geo-location-location database to determine whether the parsed geo-location and/or parsed position corresponds to a location within the geo-location-location database. For example, when the user **112**A wearing the monitoring device **108**A is traveling at a speed is greater than s_2 miles per hour and a number of steps taken by the user **112**A is greater than ss_1 per hour, the user **112**A is running. In this example, when a geo-location of the monitoring device **108**A corresponds to a park as indicated within the geo-location-location database, the user **112**A is running at the park. The activity of running corresponds to the number of steps and the speed. As another example, when the user **112**A wearing the monitoring device **108**A is performing a swinging motion of his hand, is traveling at a speed of 0 miles per hour, and a number of steps taken by the user **112**A is zero, the user **112**A is playing golf. In this example, when a geo-location of the monitoring device **108**A corresponds to a golf course as indicated within the geo-location-location database, the user **112**A is golfing at the golf course. The activity of golfing corresponds to the number of steps, the speed, the location of golf course, and/or the swinging motion.

The processor **226**, **234**, **302**, or **190** identifies, in an operation **978**, with a location identifier, e.g., a location symbol, etc., the location determined by applying the set of rules. For example, the processor **226**, **234**, **302**, or **190** identifies a park with the location identifier **920** (FIG. **9**). As another example, the processor **226**, **234**, **302**, or **190** identifies a golf course with the location identifier **918** (FIG. **9**).

The processor **226**, **234**, **302**, or **190** overlays a location identifier determined during the operation **978** on a GUI. For example, the location identifier **918** and the location identifier **920** are overlaid within the GUI **932** (FIG. **9**).

In some embodiments, a processor applies adaptive learning of locations. For example, a processor determines that a user is at a location and/or achieves an activity level of an activity at the location for a number of times greater than a pre-determined number. The processor further determines a range of times at which the user is at the location for the number of times and/or achieves the activity level at the location. When the user visits the location on a day after the processor determines the range of times, the processor determines whether a time at which the user visits the location falls within the range of times. Upon determining that the time at which the user visits the location at a time that falls within the range of times, the processor determines that the user is at the location and/or will achieve the activity level at the location.

In several embodiments, a processor applies refined learning of location and size. For example, a processor determines that the user **112**A visits an inside the user's home and determines that one or more geo-locations within the inside of the home corresponds to the home. In this example, the processor determines that the one or more geo-locations within the inside of the home corresponds to the home based on the geo-location-location database or based on a selection received from the user indicating that the geo-locations correspond to the home. In this example, a processor determines that the user **112**A visits a backyard of the user's home and determines that one or more geo-locations of the backyard of the home correspond to the home. In this example, the processor determines that one or more geo-locations of the backyard corresponds to the home based on the geo-location-location database or based on a selection received from the user indicating that the geo-locations correspond to the home. When the user visits a geo-location within the backyard or the inside of the home for a next time, the processor determines that the user is at his/her home. It should be noted that although home is used as an example, in some embodiments, other locations, e.g., a gym, a work place, a golf course, a race track, etc., may be used.

In several embodiments, a processor determines a favorite route of a user based on a number of times the user follows the route. For example, a processor determines that a user follows a route for greater than a pre-determined number of times. In this example, the processor determines that the route is a favorite route of the user. In this example, the processor determines data associate with the route, e.g., a statistical amount of time taken to complete the route, or a location close to the route, or a destination of the route, or a combination thereof, etc. In some embodiments, the processor determines the destination of the route from a maps service or from the geo-location-location database. Examples of the statistical amount of time taken to complete the route include an average amount of time to complete the route, a maximum amount of time to complete the route, a minimum amount of time taken to complete the route, etc. In this example, the processor labels, within a GUI, the route with the data associated with the route. To illustrate, the processor labels a route as "walk to a train" instead of "walk". As another illustration, the processor labels a route as "morning walk to work" instead of "walk". As another illustration, the processor labels a route as "3 mile run down Cedar street" instead of "run". As another illustration, the processor labels a route as "6 mile beach run" instead of "run". Examples of the route include a dog walking route, a commute to work route, a running route, a route to a bus station, a route to a train station, a route to work, a route to home, a route to a friend's home, etc.

In some embodiments, a processor quantifies an emotional response when a user is responsive to a piece of entertainment. The emotional response includes a combination of the HRV and/or the GSR. Based on the emotional response, the processor assigns a rating to the piece of entertainment. For example, when the HRV and/or the GSR indicate to the processor that the user is sleeping during a movie, the processor assigns a low rating to the movie. On the other hand, when the HRV and/or the GSR indicate to the processor that the user is excited during the movie, the processor assigns a high rating to the movie. Based on the HRV and/or the GSR, the processor determines a type of the piece of entertainment that the user likes. In some embodiments, the processor prompts a user to provide the rating. The piece of entertainment may be a movie, an opera, a ballet, a concert, a song, a multimedia presentation, a television show, news, etc. Examples of a type of the piece of entertainment include a horror piece, an action piece, a drama piece, a sad piece, a comedy piece, etc.

In various embodiments, a processor determines that a user is at a location at which the piece of entertainment is presented, e.g., publicly displayed, shown, etc., and displays within a GUI that includes event data information regarding the location. For example, a processor determines that a user is at a movie theater and populates a GUI with showtimes of movies at the theater. The showtimes of the movies are obtained from a website or a database that is used to present the showtimes. Other examples of information regarding the location include video games available at a theater, types of food available at a concert, etc.

In various embodiments, a processor determines motion and location features from users to build a network database. For example, the processor determines that a user performs an activity at a location for a number of times and performs a motion signature that identifies the activity for the number of times. The motion signature is a motion of a user that is substantially repeated over a time period. For example, a first swimming motion when the user is at a swimming pool in a gym is performed on day **1** and a second swimming motion when the user is at the swimming pool at the gym is performed on day **2**. The first and second motions are within a standard deviation. When the user visits, e.g., enters, etc., the location at another time, e.g., day **3**, etc., the processor determines that the user is going to perform the same activity that the user has performed for the number of times. For example, the processor determines based on the motion signature and the location visited for the number of times as soon as the user enters a gym that the user will swim at the gym. As another example, the processor determines that the user will do yoga at a yoga place based on the motion signature and the location visited for the number of times.

It should be noted that in some embodiments, any method or function or operation that is described herein as being performed by the processor **226** of the monitoring device **108**A (FIG. **3**A) or by the processor **234** of the computing device **166** (FIG. **5**) may be performed by the processor **302** (FIG. **3**B) of the monitoring device **108**B or by the processor **190** of the server **228** (FIG. **2**A).

In some embodiments, functions or methods or operations described herein as being performed by a processor of a device are performed by one or more processors of the device. For example, a function of displaying a GUI is performed by a GPU (not shown) of the monitoring device **108**A instead of by the processor **234** (FIG. **3**A).

In a number of embodiments, all GUIs, described herein, are accessed by the user **112**A when the user **112**A accesses the user account **174** (FIG. **2**A).

In various embodiments, a web page is a GUI.

Embodiments described in the present disclosure may be practiced with various computer system configurations including hand-held devices, microprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, mainframe computers and the like.

Several embodiments described in the present disclosure can also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a wire-based or wireless network.

With the above embodiments in mind, it should be understood that a number of embodiments described in the present disclosure can employ various computer-implemented operations involving data stored in computer systems. These operations are those requiring physical manipulation of physical quantities. Any of the operations described herein that form part of various embodiments described in the present disclosure are useful machine operations. Several embodiments described in the present disclosure also relates to a device or an apparatus for performing these operations. The apparatus can be specially constructed for a purpose, or the apparatus can be a computer selectively activated or configured by a computer program stored in the computer. In particular, various machines can be used with computer programs written in accordance with the teachings herein, or it may be more convenient to construct a more specialized apparatus to perform the required operations.

Various embodiments described in the present disclosure can also be embodied as computer-readable code on a non-transitory computer-readable medium. The computer-readable medium is any data storage device, e.g., the memory device **280** of the monitoring device **108**A, the memory device **298** of the monitoring device **108**B, the memory device **338** of the computing device **166**, the memory device **256** of the server **228**, etc., that can store data, which can be thereafter be read by a computer system. Examples of the computer-readable medium include hard drives, network attached storage (NAS), ROM, RAM, compact disc-ROMs (CD-ROMs), CD-recordables (CD-Rs), CD-rewritables (RWs), magnetic tapes and other optical and non-optical data storage devices. The computer-readable medium can include computer-readable tangible medium distributed over a network-coupled computer system so that the computer-readable code is stored and executed in a distributed fashion.

Although the method operations were described in a specific order, it should be understood that other housekeeping operations may be performed in between operations, or operations may be performed in an order other than that shown, or operations may be adjusted so that they occur at slightly different times, or may be distributed in a system which allows the occurrence of the processing operations at various intervals associated with the processing, as long as the processing of the overlay operations are performed in the desired way. For example, the operations **104** and **118** in FIG. **6**A are performed simultaneously or the operation **118** is performed before the operation **104**. As another example, the operations **202** and **204** of FIG. **6**D are performed simultaneously or the operation **204** is performed before performing the operation **202**. As yet another example, the operation **223** of FIG. **6**F may be performed before, or after, or simultaneous with the performance of the operation **229**.

Although the foregoing embodiments have been described in some detail for purposes of clarity of understanding, it will be apparent that certain changes and modifications can be practiced within the scope of the appended claims. Accordingly, the present embodiments are to be considered as illustrative and not restrictive, and the various embodiments described in the present disclosure is not to be limited to the details given herein, but may be modified within the scope and equivalents of the appended claims.

The invention claimed is:

1. A monitoring device comprising:

a motion sensor configured to measure an amount of movement of a user;

a heart rate measurement sensor configured to measure a heart rate of the user;

a time measurement device configured to determine an amount of time during which the heart rate is measured;

a display device; and

a processor coupled to the display device, the motion sensor, the heart rate measurement sensor, and the time measurement device, the processor configured to execute a computer readable code accessed from a memory device of the monitoring device to:

identify the amount of time measured by the time measurement device, wherein the amount of time comprises:

a first portion of the amount of time during which the user is sleeping, and

a second portion of the amount of time during which the user is not sleeping:

determine a number of calories burned by the user during the amount of time:

identify the second portion of the amount of time during which the user is not sleeping based on the amount of movement, the number of calories burned by the user, and the heart rate of the user during the amount of time:

determine the heart rate of the user, the number of calories burned by the user, and the amount of movement of the user during the second portion of the amount of time;

classify an activity performed by the user during the second portion of the amount of time for which the user is not sleeping as a sedentary activity based on the determined heart rate of the user, the number of calories burned by the user, and the amount of movement of the user during the second portion of the amount of time;

determine a non-sedentary activity to be performed by the user upon said classifying the activity as the sedentary activity, wherein the non-sedentary activity increases an activity level of the user; and

generate a notification for presentation on the display device recommending the user to increase the activity level by performing the non-sedentary activity, wherein the display device is further configured to display an indication of a time interval during the second portion of the amount of time for which the sedentary activity has occurred.

2. The monitoring device of claim **1**, wherein the processor is further configured to classify the activity as the sedentary activity upon determining that the user is not walking, not running, not moving around, or not in a vehicle.

3. The monitoring device of claim **1**, wherein the motion sensor is an accelerometer.

4. The monitoring device of claim **1**, wherein the monitoring device is a wrist watch, or a wristband, or a bracelet.

5. The monitoring device of claim **1**, wherein the display device includes a display screen to display graphical user interface data that includes activity levels of the sedentary activity performed by the user.

6. The monitoring device of claim **1**, wherein the indication of the time interval comprises a time identifier for the sedentary activity.

7. The monitoring device of claim **1**, wherein the time measurement device is further configured to determine a quantity of time for a number of positions that are reached during the amount of movement that is measured by the motion sensor.

8. A method comprising:

receiving a plurality of activity parameters, wherein the activity parameters include an amount of movement of a user and a physiological parameter comprises a heart rate of the user that are collected by a monitoring device with one or more sensors, wherein the monitoring device is configured to be coupled to a body of the user;

determining a number of calories burned by the user;

determining an amount of time during which the physiological parameter of the user is measured;

identify a first portion of the amount of time during which the user is sleeping;

identify a second portion of the amount of time during which the user is not sleeping;

determining the second portion of the amount of time during which the user is not sleeping based on the activity parameters and the number of calories burned by the user;

classifying an activity performed by the user during the second portion of the amount of time of the user is not sleeping as a sedentary activity based on an analysis of the activity parameters and the number of calories burned by the user;

determining a non-sedentary activity to be performed by the user upon said classifying the activity as the sedentary activity, wherein the non-sedentary activity increases an activity level of the user; and

generating a notification recommending the user to increase the activity level by performing the non-sedentary activity; and

displaying an indication of a time interval during the second portion of the amount of time for which the sedentary activity has occurred.

9. The method of claim 8, wherein the monitoring device is a wrist watch, or a wristband, or a bracelet.

10. The method of claim 8, wherein said classifying the activity as the sedentary activity includes determining at least one of that the user is not walking, not running, not moving around, and not in a vehicle.

11. The method of claim 8, wherein the one or more sensors include a motion sensor and a heart rate measurement sensor.

12. The method of claim 8, wherein the one or more sensors include an environmental sensor and a biological sensor.

13. The method of claim 8, further comprising displaying information describing the sedentary activity on a graphical user interface.

14. The method of claim 8, wherein the indication of the time interval comprises a time identifier for the sedentary activity.

15. A non-transitory computer-readable medium containing programming instructions that cause a computer processor of a monitoring device to perform operations of:

receiving a plurality of activity parameters, wherein the activity parameters include an amount of movement of a user and a physiological parameter comprises a heart rate of the user that are collected by the monitoring device with one or more sensors, wherein the monitoring device is configured to be coupled to a body of the user;

determining a number of calories burned by the user;

determining an amount of time during which the physiological parameter of the user is measured;

identify a first portion of the amount of time during which the user is sleeping;

identify a second portion of the amount of time during which the user is not sleeping;

determining the second portion of the amount of time during which the user is not sleeping based on the activity parameters and the number of calories burned by the user;

classifying an activity performed by the user during the second portion of the amount of time of the user is not sleeping as a sedentary activity based on an analysis of the activity parameters and the number of calories burned by the user;

determining a non-sedentary activity to be performed by the user upon said classifying the activity as the sedentary activity, wherein the non-sedentary activity increases an activity level of the user; and

generating a notification recommending that the user to perform increase the activity level by performing the non-sedentary activity; and

displaying an indication of a time interval during the second portion of the amount of time for which the sedentary activity has occurred.

16. The non-transitory computer-readable medium of claim 15, wherein the monitoring device is a wrist watch, or a wristband, or a bracelet.

17. The non-transitory computer-readable medium of claim 15, wherein the classifying the activity performed by the user as the sedentary activity includes determining at least one of that the user is not walking, not running, not moving around, or not in a vehicle.

18. The non-transitory computer-readable medium of claim 15, wherein the one or more sensors include a motion sensor and a heart rate measurement sensor.

19. The non-transitory computer-readable medium of claim 15, wherein the operations further comprise displaying information describing the sedentary activity on a graphical user interface.

20. The non-transitory computer readable medium of claim 15, wherein the indication of the time interval comprises a time identifier for the sedentary activity.

* * * * *

专利名称(译)	用于生成和呈现具有组合的活动和位置信息的交互事件的方法和系统		
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[标]申请(专利权)人(译)	飞比特公司		
申请(专利权)人(译)	FITBIT INC.		
当前申请(专利权)人(译)	FITBIT INC.		
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发明人	YUEN, SHELTEN GEE JAO PARK, JAMES LEE, HANS CHRISTIANSEN		
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优先权	13/959717 2014-06-24 US 13/693334 2013-10-01 US 13/667229 2013-05-07 US 13/469027 2012-11-13 US 13/246843 2012-05-15 US 13/759485 2013-09-24 US 61/680230 2012-08-06 US 61/388595 2010-09-30 US 61/390811 2010-10-07 US		
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摘要(译)

描述了一种计算机实现的方法。计算机实现的方法用于填充图形用户界面（GUI）的数据。该计算机实现的方法包括生成由监视设备捕获的一个或多个活动的一个或多个图形元素。在捕获期间，用户可以使用监视设备。该方法还包括生成包括执行活动的时间段的时间线。时间线包括该时间段内的时间顺序。该方法还包括为在该时间段期间执行的一个或多个活动生成活动符号。活动符号具有图形覆盖在活动的图形元素上的图像。