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(54) **METHOD AND SYSTEM FOR GATHERING AND COMPUTING AN AUDIENCE'S NEUROLOGICALLY-BASED REACTIONS IN A DISTRIBUTED FRAMEWORK INVOLVING REMOTE STORAGE AND COMPUTING**

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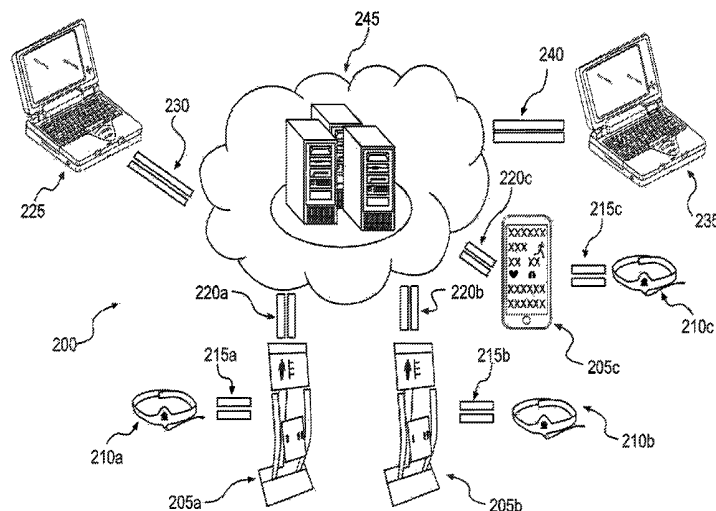
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(57) **ABSTRACT**

Systems and methods for measuring biologically and behaviorally based responses to content in targeted demographics and locations by way of remote monitoring. Stimuli may be based on location, target demographics, and combinations thereof.

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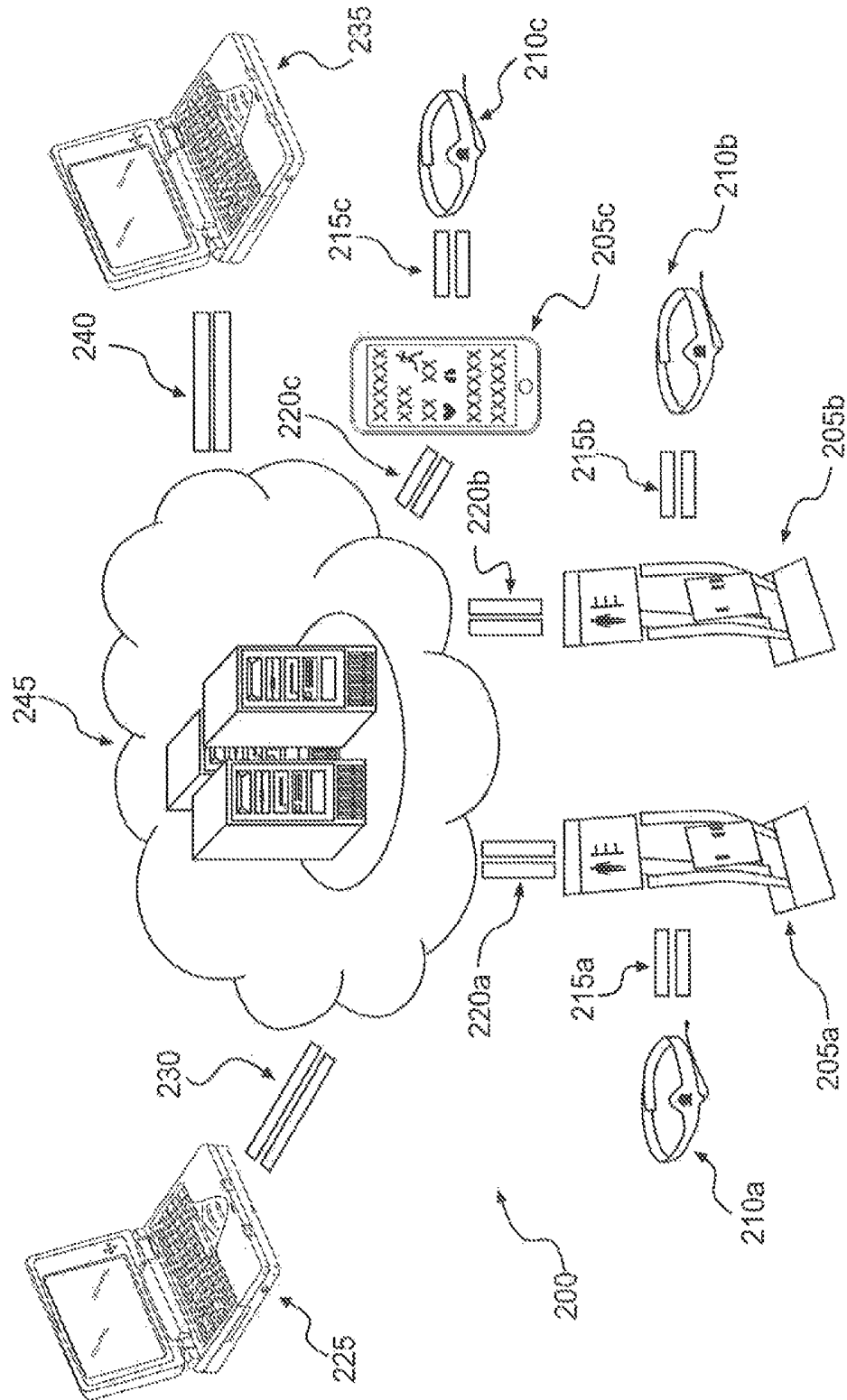


FIG. 1

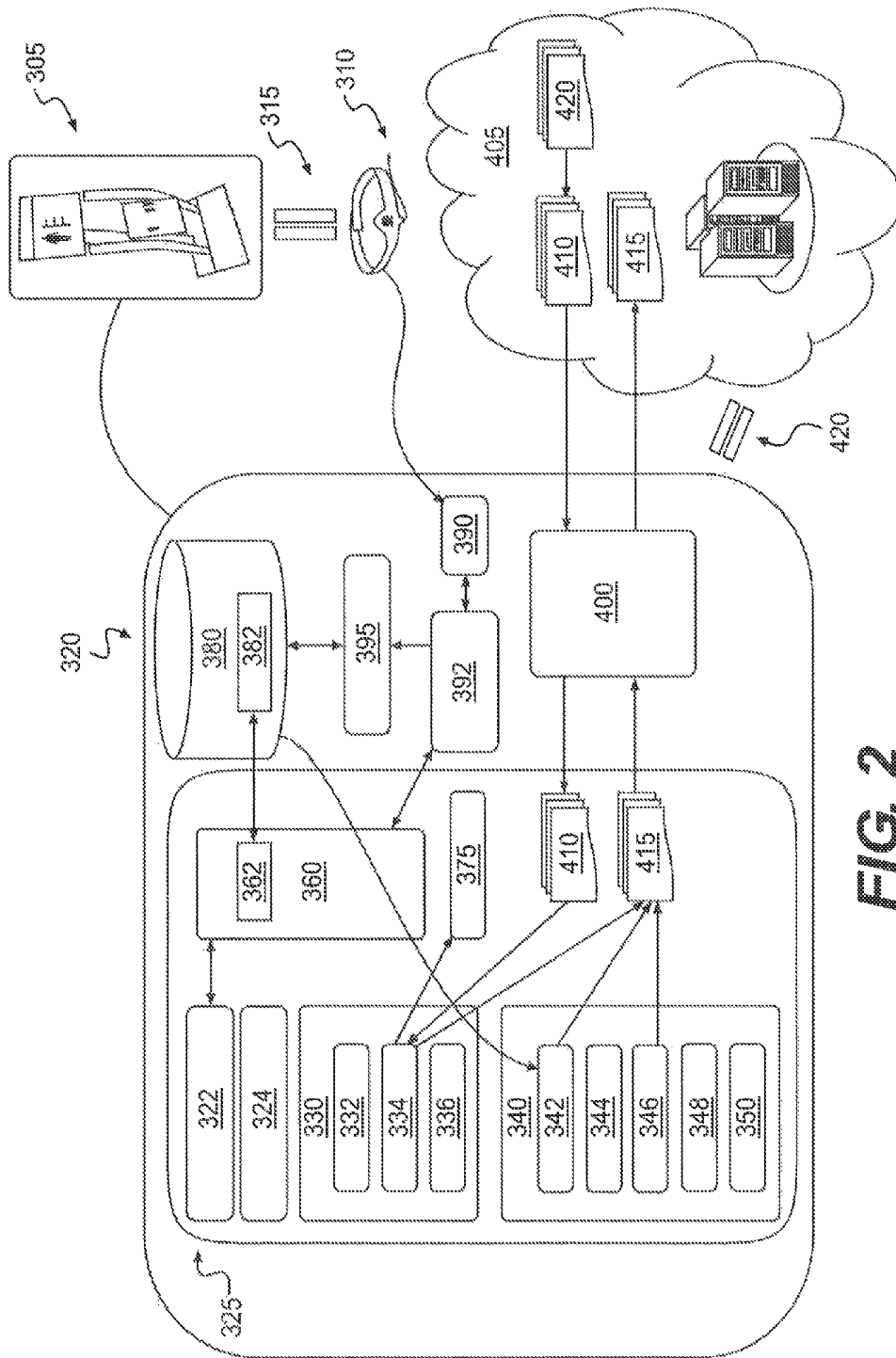


FIG. 2

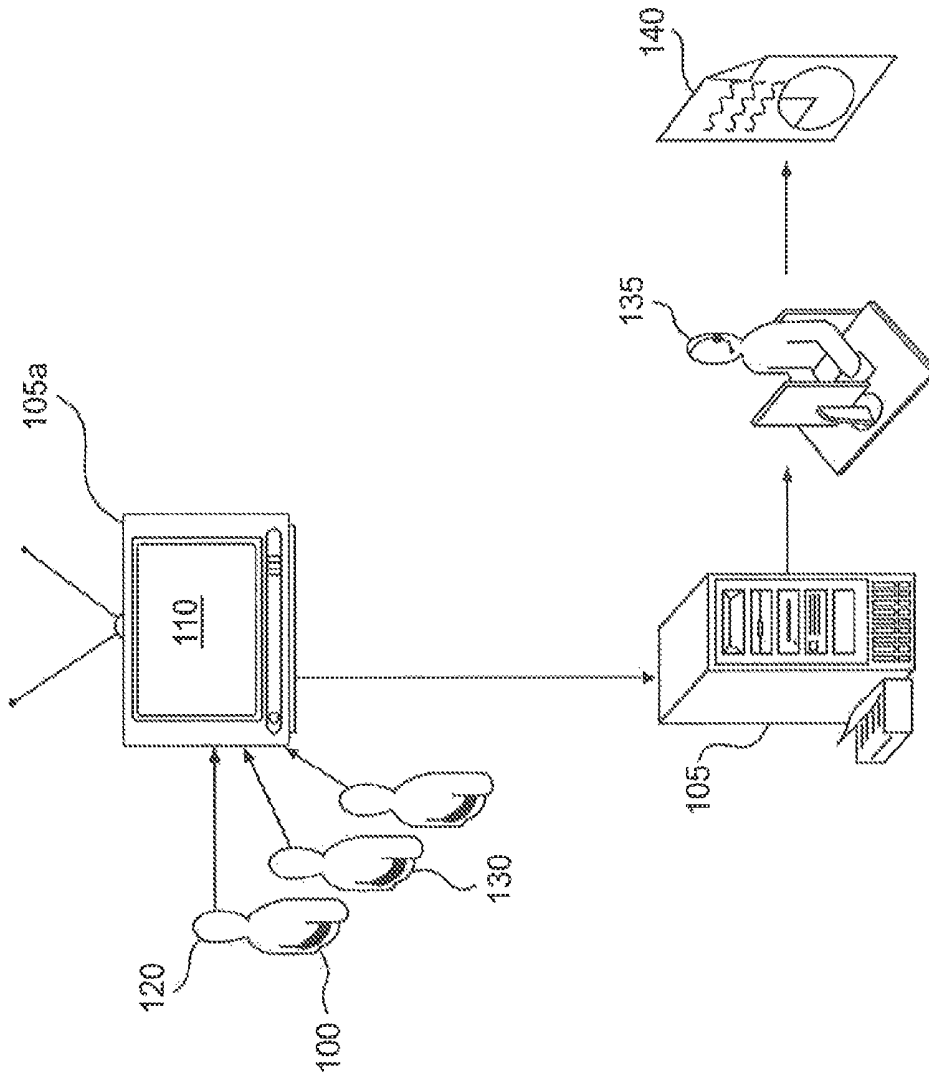


FIG. 3

**METHOD AND SYSTEM FOR GATHERING  
AND COMPUTING AN AUDIENCE'S  
NEUROLOGICALLY-BASED REACTIONS IN  
A DISTRIBUTED FRAMEWORK INVOLVING  
REMOTE STORAGE AND COMPUTING**

CROSS REFERENCE TO RELATED  
APPLICATIONS

This application is a continuation-in-part of U.S. patent application Ser. No. 13/405,611, filed Feb. 27, 2012, now pending. This application also claims priority to U.S. Provisional Patent Application No. 61/603,521, filed Feb. 27, 2012. Each of these applications is incorporated herein by reference in their entirety.

FIELD OF THE INVENTION

The present invention relates to systems and methods for measuring biologically and behaviorally based responses to content in targeted demographics and locations. More specifically, the present invention relates to systems and methods for implementing remote monitoring of unconscious biologically based and behaviorally based responses when presented with target stimuli.

BACKGROUND OF THE INVENTION

There are many different kinds of audio, visual and audio-visual presentations and activities that people are exposed to every day. These presentations serve as sensory experiences that stimulate our senses and are known to result in biologically based responses that can be measured electronically and mechanically (for example, heart rate, respiration rate, blood pressure, and skin conductance).

A commonly used approach in making measurements for evaluating these presentations is that of interrogation, wherein the television/media viewer and/or Internet user and/or game player is asked to identify himself or herself as a member of the television/media audience or as an Internet user or as a game player. In connection with television viewing, this inquiry is usually done by means of an electronic prompting and data input device (for example, as in a Portable People Meter by Arbitron, Inc.) associated with a monitored receiver in a statistically selected population and monitoring site. The member identification may also include age, sex, and other demographic data. However, these non-biologically based self-report methods of measuring audience response are known to be highly error prone.

In fact, personal logs are subjective resulting in recall biases, home monitoring devices require event-recording by the person and suffer low compliance, while digital monitoring of cable and internet signals cannot identify which household member or members are in the audience nor can they evaluate the level of responsiveness by those members. Other methods of self-report offer valuable data, but are highly error prone and cannot track the moment-to moment responses to media consumption and participation in interactive activities.

In particular, with the development of the Internet and its expansion into many everyday activities, people are constantly exposed to interactive media and activities. Nonetheless, the ability to measure and evaluate the user experience, effectiveness, and the usability of these interactive media has been limited. In fact, current methodologies for measuring or evaluating user experience, effectiveness, and usability of websites and other interactive Internet and

software media has thus far been limited to traditional self-report and eye-tracking on an individual user basis. These prior art techniques involved asking the individual user questions about the experience and evaluating where the user was looking during the interactive activity.

These prior art systems require advanced knowledge of demographic data prior to the implementation of the system. For example, in order to ensure an audience made of selected demographics and geographic regions, the audience must be prescreened to identify individuals and households within the specific geographic regions and within the specified demographic categories. Thus, the only alternative is to select individuals and households at random. However, selecting individuals and households at random does not guarantee that certain demographics and/or geographic areas are available for research.

The majority of systems acquiring biologically based signals for measuring the performance of content stimuli are laboratory-based where participants are brought in to a testing facility and their biologically-based signals are acquired using specialized equipment while watching target content. While attempts have been made to gather EEG data in home environments, compliance by the targeted audience is difficult because there is no guarantee as to whether or not the signals collected remotely are from the targeted person or another member of the household.

Accordingly, the challenges of the current methods and systems include, but are not limited to: (1) security (due to the content being provided over the interact or through a home monitoring device which then creates the possibility of an audience member recording and subsequently distributing the content); (2) carefully selected distribution mandatory (in order to reach a wide array of people and fulfill targeted demographics); (3) errors (due to the heavy reliance on self-reporting); and verification of compliance with study parameters (such as whether the data collected is from the targeted demographic); (5) associated costs with (a) lab-based methods (bringing the audience into the lab are very high) and (b) home-based audience monitoring (the costs of ensuring compliance are high), and for both (a) and (b) ensuring a geographic distribution is not easy and could compound the associated costs); and (6) determination of invalid signals is unavailable until post-processing (which requires additional steps and increases costs).

Thus, a need in the art exists for a system and method that is capable of integrating self report and physiological data and capable of secure distribution. In addition, a need exists for an efficient and cost-effective system and method that is capable of integrating self-report and physiological data that can ensure a wide geographic distribution to an audience. Finally, a need exists for a system that is capable of providing results from a wide variety of demographic categories when monitoring unconscious biologically based and behaviorally based responses to track performance of target stimuli.

Using a cloud infrastructure to implement such a system and method allows for lower maintenance costs, high availability, security, and reliability, faster distribution/propagation of content to a wide-range of geographic locations, scalability based on workloads (number of projects), and adjustability for specific geographic locations.

SUMMARY OF THE INVENTION

The present invention is directed to a method of determining a measure of response of remotely located audiences to a target stimulus at a plurality of locations including the

steps of: providing at each location at least one biologically based sensor operable to measure at least one unconscious biological response for each member of an audience; providing at each location a computer system operable to receive data representative of the at least one unconscious biological response, wherein the computer further includes a memory for storing the data; receiving at each location at least one target stimulus; exposing each member of the audience at each location to a presentation of the at least one target stimulus; obtaining a first set of data representative of the at least one unconscious biological response from the presentation for each audience member; and transmitting the first set of data to a central location for analysis.

In one embodiment, the method further includes the step of analyzing the first set of data and reporting the results. In another embodiment, the method further comprises the step of comparing the first set of data to data from a standard testing template of content stimuli.

The at least one unconscious biological response may include heart rate, galvanic skin response, respiration, and motion. In one embodiment, the at least one biologically based sensor includes a first sensor operable to measure heart rate and a second sensor operable to measure galvanic skin response.

In another embodiment, the method further includes the steps of providing at each location at least one of a biologically based measuring device operable to measure EEG, at least one neuroimaging modality, or a combination thereof, a device operable to measure facial expression, a device operable to measure eye movement, or combination thereof, wherein the computer system is operable to receive and store data representative of EEG, at least one neuroimaging modality, facial expression, eye movement, and combinations thereof; obtaining a second set of data representative of at least one of EEG, at least one neuroimaging modality, facial expression, eye movement, or combinations thereof from the presentation for each audience member; and transmitting the second set of data to a central location for analysis.

The method may also include the step of receiving demographic information in at least one demographic category from each member of the audience. In one embodiment, the at least one demographic category comprises age, gender, race, income, and educational background. In another embodiment, the system may aggregate the demographic information for each demographic category, receive a terminal value for each demographic category, receive an alternate target stimulus, and expose an individual audience member within a certain demographic category to a presentation of the alternate target stimulus if the terminal value for the certain demographic category has been reached.

The present invention is also directed to a system for determining a measure of response of a remotely located audience to a target stimulus including: at least one biologically based sensor operable to measure at least one unconscious biological response for each member of an audience; a computer system operable to receive data representative of the at least one unconscious biological response, wherein the computer system further includes a memory capable of storing the data, wherein the system is capable of receiving at least one target stimulus, wherein the system is capable of exposing each audience member to a presentation of the target stimulus, wherein the system is capable of receiving data representative of the at least one unconscious biological response for each audience member from a plurality of locations and audiences, and wherein the system is capable

of obtaining demographic information from each member of each audience in each location.

In one embodiment, the system is self-contained in a single unit. The single unit may be a kiosk, a smart phone, or a tablet. In another embodiment, the demographic information includes a plurality of categories comprising at least one of age, gender, race, income, and educational background.

The at least one unconscious biological response comprises heart rate, galvanic skin response, respiration, and motion. The system may also further include at least one biologically based measuring device operable to track eye movement, wherein the system is capable of receiving data representative of the eye movement for each audience member from a plurality of locations and audiences. In another embodiment, the system may further include at least one device operable to measure facial expressions at predetermined time intervals, wherein the system is capable of receiving data representative of the facial expressions for each audience member from a plurality of locations and audiences. In yet another embodiment, the system may also further include at least one device operable to measure EEG, at least one neuroimaging modality, or combinations thereof, wherein the system is capable of receiving data representative of the EEG, at least one neuroimaging modality, or combinations thereof for each audience member from a plurality of locations and audiences.

In still another embodiment, the system may include a plurality of biologically based sensors to measure unconscious biological responses such as heart rate, galvanic skin response, respiration, and motion, at least one biologically based measuring device operable to track eye movement, at least one device operable to measure facial expressions at predetermined time intervals, and at least one device operable to measure EEG, at least one neuroimaging modality, or combinations thereof, any of all of which may be operable depending on the particular target stimuli presented. For example, the system may include all of the sensors above, but a client may request only particular measurements for any given presentation.

The system may also be capable of receiving a capacity value for each demographic category and location for a presentation of the target stimulus, wherein the system is capable of receiving an alternate target stimulus, and wherein the system is capable of exposing an audience member to a presentation of the alternate target stimulus when the capacity value is obtained. In one embodiment, the capacity values are distributed equally for each location. In another embodiment, the system is capable of receiving target demographic density information for each location. In still another embodiment, the capacity values are allocated proportionate to the target demographic density information in the location.

The system may also be capable of reporting the data representative of the at least one unconscious biological response for each audience member from a plurality of locations and audiences and demographic data to a central location. In another aspect, the system may be operable to provide a plurality of target stimuli based on at least one of geographic location or demographic category.

The present invention also relates to a system and method of implementing a scalable, reliable, efficient and cost effective distributed biometric monitoring and data acquisition system. In one embodiment, the system and method involves cloud-based server-client technology to allow for monitoring of a plurality of members of an audience or group in asynchronous geographically distributed environments and

collecting the participants' physiological, eye tracking, and facial expression reactions to the presented content.

The present invention is also directed to a system for determining a measure of response of a remotely located audience to a target stimulus including: at least one biologically based sensor located in a remote station operable to measure at least one unconscious neurologically based brain response for each member of an audience; a computer system operable to receive a first set of data representative of the at least one unconscious neurologically based brain response for each audience member from a plurality of locations and audiences, wherein the computer system further includes a remote memory capable of receiving and storing the first set of data, wherein the system is capable of receiving and storing a plurality of target stimuli, wherein the system is capable of exposing each audience member to a presentation of the target stimulus, and wherein the system is capable of obtaining demographic information from each member of each audience in each location.

In one embodiment, the at least one unconscious neurologically based brain response includes skin conductance, heart rate, respiration, EEG, head movement, or a combination thereof. In another embodiment, the computer system is operable to receive a second set of data representative of at least one other unconscious neurologically based brain response for each audience member, and wherein the at least one other unconscious neurologically based brain response includes facial expression, eye tracking, or a combination thereof.

In still another embodiment, the system includes a remote location software module including a recording module to obtain the at least one other unconscious neurologically based brain response. The recording module may include a camera, a video recorder, an eye tracker, or a combination thereof.

In one embodiment, the at least one target stimulus is stored remotely from the remote station. In another embodiment, the system is capable of selecting the presentation of the target stimulus from a plurality of target stimuli based on a plurality of factors, wherein the plurality of factors includes the demographic information. The demographic information may include at least one of age, gender, race, income, educational background, or a combination thereof.

The present invention is also directed to a system for determining a measure of response of a remotely located audience to a presentation including: at least one biologically based sensor located in a remote station operable to measure a plurality of unconscious neurologically based brain responses for each member of an audience; a computer system operable to receive a first set of data representative of the plurality of unconscious neurologically based brain responses for each audience member from a plurality of locations and audiences, wherein the computer system further includes a remote memory capable of receiving and storing the first set of data, wherein the system is capable of receiving and storing a plurality of target stimuli, wherein the system is capable of exposing each audience member to a presentation, and wherein the system is capable of obtaining demographic information from each member of each audience in each location.

In one embodiment, the at least one biologically based sensor includes a first sensor operable to measure heart rate and a second sensor operable to measure galvanic skin response. In another embodiment, the system further includes a recording module located in the remote station operable to measure at least one of facial expression, eye movements, or combination thereof. In still another embodi-

ment, the system is operable to receive a second set of data representative of the recorded facial expression, eye movements, or combination thereof. The remote memory may be capable of receiving and storing the second set of data.

In another embodiment, the system is capable of receiving a capacity value for each demographic category and location for a presentation, wherein the system is capable of receiving an alternate presentation, and wherein the system is capable of exposing an audience member to a presentation of the alternate presentation when the capacity value is obtained. The capacity values may be distributed equally for each location. In yet another embodiment, the system is capable of reporting the first set of data for each audience member from a plurality of locations and audiences and demographic data to a central location.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages of the invention can be ascertained from the following detailed description that is provided in connection with the drawings described below:

FIG. 1 is a schematic of the physical hardware incorporated into the system according to one embodiment of the invention;

FIG. 2 is a schematic of the software components according to one embodiment of the invention; and

FIG. 3 is an example of an embodiment of the method of the invention.

#### DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a system and method of measuring biologically and behaviorally based responses to content in targeted demographics and locations using cloud infrastructure. In one embodiment, the system and method involves cloud-based server-client technology to allow for monitoring of a plurality of members of an audience or group in asynchronous geographically distributed environments by using remotely located stations units and storing and processing the content, parameters, data (physiological reactions, eye tracking data, facial expression data, self-report data), and results of the project in the cloud.

The present invention is directed to a research method and system for measuring an audience's physical, behavioral, biological and self-report responses to a sensory stimulus and reporting the results to a central location. In particular, the invention is directed to a method and system for exposing an audience to a stimulus, measuring one or more unconscious responses of one or more persons being exposed to a sensory stimulus, presentation, or interactive activity, and reporting the results to a central location. The invention allows for screening of relevant participants using client-specified demographic-targeting criteria, in geographically dispersed environments, identifying and detecting whether or not the participants have valid signal ranges during a test, thereby eliminating over-recruits and costs. Furthermore, the invention can be used to determine whether the presentation or interactive activity is more effective in a population relative to other presentations and other populations (such as may be defined by demographic, geographic, or psychographic criterion).

The sensory stimulus, presentation, or interactive activity may include an audio, visual or audiovisual stimulus, such as a sound or sequence of sounds, a picture or a sequence of pictures including video, or a combination of one or more sounds and one or more pictures, including video. The

stimulus can be prerecorded and played back on a presentation device or system (e.g., on a television, video display, projected on a screen, such as a movie) or experienced as a live performance. The stimulus can be passive, where the audience experiences the stimulus from a stationary location (e.g., in front of a television or video screen) or the stimulus can be interactive where the audience is participating in some form with stimulus (e.g., simulated roller coaster ride, shopping experience, computer game, virtual reality experience or an interactive session via the internet).

The deployment of the specific projects is described in greater detail below. Briefly, through the use of remotely located units (e.g., kiosks or smart phones or tablets), the project may include the steps of: providing at each location at least one biologically based sensor operable to measure unconscious biologically based responses and/or behaviorally based responses for each member of an audience; providing at each location a computer system operable to receive data representative of the unconscious biologically based response and/or behaviorally based response; receiving from the cloud infrastructure at each location at least one target stimulus; exposing each member of the audience at each location to a presentation of the at least one target stimulus; obtaining data representative of the at least one biologically based response and/or behaviorally based response from the presentation for each participant.

According to one aspect of the invention, the system includes a display device, a processor, and at least one biologically based sensor operable to measure unconscious biologically based responses. Preferably, the system is operatively connected to a server allowing for data to be sent and received by the system. In one embodiment, the system is equipped to simultaneously expose content (e.g., a sensory stimulus, presentation, or interactive activity) to a plurality of audience members. The system may also be operatively connected to one or more sensors for measuring eye movement/pupil dilation. According to one aspect of the invention, the system also includes one or more self-report surveys.

In one embodiment of the invention, a system that captures specific, unconscious biologically based signals (such as skin conductance and heart rate), optionally with other unconscious biologically based signals (such as respiration and movement), may be built using sensors that maintain the portability of the system and thus allow the system to be deployable in various geographic locations using cost-effective equipment. Additional unconscious responses or signals may also be captured by the system at varying incremental costs. For example, eye tracking, facial coding, EEG, fMRI, PET scan, MEG and the like may be used to capture additional data in response to content.

In one embodiment, the entire system may be contained in a single unit, which beneficially allows the system to be easily and rapidly deployed to a variety of locations. For example, the system may be implemented in a kiosk and deployed to a variety of public locations including, but not limited to, shopping malls, movie theatre lobbies, hotel lobbies, airport terminals, train stations, food courts, car dealership showrooms, or other public venues. The system may also be implemented in a smart phone, tablet, or the like. The ability to distribute the system to a wide variety of locations allows for a large sample population. In addition, the ability to deploy the system to specific locations allows for the ability to reach a target audience without subjecting the audience to the burden of travelling to a lab. For example, an advertiser interested in feedback from football fans could deploy a kiosk to a football stadium instead of

identifying football fans in the general population and attempting to lure the fans into a lab for testing.

In one embodiment of the invention, the system is capable of displaying content relevant to the location or independent of the location. For example, in car showrooms the content displayed and tested may be related to only new cars, and unrelated to the location of the showroom. In the alternative, content related to a specific location or relevant to the population in the specific location may be displayed and tested.

According to one aspect of the invention, the system is capable of receiving instructions and content. Thus, the system may receive specific content directly from a company/client seeking feedback on an advertisement, television show, movie, website, etc. without requiring submission of the content to the system provider and or involving delay while the system provider uploads the content for review by an audience. In addition, the system is capable of transmitting the measurements and data. Preferably, the system transmits or sends data at a predefined interval. For example, the data collected by the system may be sent on a daily basis, weekly basis, or other suitable time frame. The system may also detect "idle-times" between sessions of two participants and transfer the data to the central location. According to one embodiment, the system is programmable to alter the data collection and transmission period as desired or automatically optimize to ensure less interruption of the content-viewing on the kiosks, smart phones, tablets, or the like.

#### Display Device

In one embodiment of the invention, any suitable display device known in the art may be employed. Suitable display devices include, but are not limited to, televisions, LCD screens, touch screens, 3-D displays, movie screen, head-mounted displays, plasma screens, a desk-top, hand-held or wearable computer device, gaming console, home or portable music device, or any other device for the presentation of passive or interactive audio, visual or audio-visual presentation. The system could also be displayed on user devices in the location such as mobile phones and other devices that include a display. A skilled artisan would readily appreciate that other technologies may be employed that are capable of exposing an audience member to a sensory stimulus, presentation, or interactive activity.

#### Sensors

Responses that are based in human biology can have multiple physiologic and behavioral correlations. Thus, embodiments of the present invention may include a plurality of devices and sensors to measure the unconscious biologically based responses.

One aspect of the invention includes collecting at least one measurement by eye-tracking. The eye-tracking measures can include, but are not limited to, visual attention as estimated by gaze location, fixation duration, pupil dilation, and movement within a localized area. The system can use eye-tracking or other technology to isolate specific elements, areas or moments of interest for further analysis or processing. In accordance with one aspect of the invention, the system can track what content is being viewed, who is viewing the content (including by gender and demographic/psychographic profile), which areas or sub-areas of the content are being focused on by each individual and which measured responses of the audience correspond to the viewed content.

Another aspect of the present invention includes collecting unconscious biologically based responses by measuring galvanic skin response (GSR), heart rate, heart rate variability, brain-wave activity, respiration activity, facial emotional

responses (collected by video or other similar methods), eye tracking, and combinations thereof. In a preferred embodiment, at least two measures of unconscious biologically based responses are obtained by the system.

The biologically based sensors or monitoring devices for measuring the unconscious biologically based responses may include any of a number of commercially available or other sensors known in the art for measuring such responses. In accordance with one aspect of the invention, the least invasive and obtrusive sensors with the most comfortable form factor should be chosen to minimize disruption of the experience. Preferably, the sensors should allow participants to experience the presentation or test stimulus "as if" they were not being monitored at all. Suitable biologically based sensors include but are not limited to wearable devices such as "smart" garments, wrist bands, shirts, sleeves, arm bands, cameras, watches, and head-gear. Multiple combinations of sensors can be used depending on the sensory stimulus, population, and location of the monitoring. In a preferred embodiment, the biologically based sensor is an arm band.

A third aspect of the present invention includes collecting behavioral data from the participants. Behavioral type responses can include, but are not limited to, facial micro and macro-expressions, head tilt, head lean, body position, body posture, body movement, and amount of pressure applied to a computer mouse or similar input or controlling device. One or more cameras and/or pressure sensors may be used in accordance with this aspect of the invention to collect behavioral data.

Self-report type measures can include, but are not limited to, survey responses to items such as perception of the experience, perception of usability or likeability of experience, demographic data, level of personal relevance to user, attitude toward content or advertising embedded in the content, intent to purchase product, game or service, and changes in responses from before and after or pre-post testing. According to one aspect, the system includes one or more data entry device. The self-report device can be any of the well-known devices for permitting an audience member to report their response to a presentation or interactive activity. Typically, self-report devices include a knob, a slider or a keypad that is operated by the audience member to indicate their level of interest in the presentation. By turning the knob, moving slider or pressing a specific button on the keypad, the audience member can indicate their level of interest in the presentation or interactive activity. Alternatively, self-report device can be a computer keyboard and/or mouse that an audience member can use to interact with the presentation. Mouse movements in association with icons or elements on the computer screen can be used to indicate levels of interest. In addition, the mouse or other input device can include sensors, such as force and pressure sensors for measuring the forces applied to the mouse by the audience members. Alternatively, keyboard keys (up arrow, down arrow, page up and page down), can used to indicate levels of interest. In addition, the user can type in responses to questions or select answers to multiple choice questions. Suitable data entry devices include, but are not limited to, a mouse, keyboards, knobs, buttons, sliders, touch screens, voice recognition technology, and variations thereof. According to one aspect, the audience member enters information manually. In the alternative, one or more administrators may enter the information for an audience member. Computer Systems and Cloud Infrastructure

Some or all of the sensor data and input data can be transferred either by wire or wirelessly to the computer system and further transferred to a data processing system.

Alternatively, some or all of the sensor and input data can be transferred directly to the data processing system by wired or wireless network. The network can utilize most communication technologies, including RS-232, Ethernet, Wi-Fi, Blue Tooth and Zigbee, for example. In addition, more than one communication technology can be used at the same time, for example, the network can included wired components (such as, Ethernet and digital cable) and wireless components (such as, Wi-Fi, WiMAX and Blue Tooth) to connect different sensors and computer system components to the data processing system. Furthermore, the data processing system can be one computer system or a cluster, group, or network of computer systems. For example, several kiosks containing the systems may be operatively connected to one another via a network.

The computer system may also include a locating device, such as a GPS device, capable of recording and reporting the position of the system via wired or wireless connection. According to one aspect of the invention, the locating device is capable of identifying and reporting the position (direction and distance) of the system in relation to other locations, including but not limited to, towns, cities, landmarks, and other reporting systems in a network of systems.

FIG. 1 generally shows an embodiment of the system of the invention using the cloud infrastructure. In one embodiment, the system and method of the invention is capable of project creation and dissemination via the cloud infrastructure. For example, a specific project, e.g., two advertisements to evaluate for response, would be created using the cloud infrastructure 245. In particular, it is contemplated that the content is created with computer system 225, which in this example scenario includes advertisements, would be uploaded to a specific area in the cloud storage via link 230. In addition, any other content that is intended to be used for the project, e.g., baseline content, specific content for context, anchoring commercials, and the like, would also be uploaded or transferred to the specific area via link 230 in the cloud storage 245. In fact, any one test may include a presentation of a mixed sequence of content stimuli, as well as self-report surveys (before and after the presentation of content stimuli). As such the self-report surveys and the following types of content stimuli may be stored in the cloud 245 for use in the project in the form of content-reels. Each content-reel may have one or more occurrences of the following items in pre-determined orders (to balance for priming and other influences):

1. Baseline content including a variety of standard images such as the International Affective Picture System (IAPS), standard video content to evoke a range of emotions for the audience, and optional standard web content to evoke a range of web experiences;
2. Specific content for context including television programs (e.g., Everybody Loves Raymond), movie trailers, and the like that are typically aired during prime-time programming;
3. Anchoring commercials, which include standard commercials (non-target) that are inserted into multiple studies to remove priming effects and to "normalize" across different audience segments and standardize scores; and/or
4. Target content, which includes specific commercials, programs, movies, websites, and the like to be tested/ studied for performance/success.
5. Online web content, that is relevant for a client test

6. Online self-report surveys, which may be designed to determine how much the participant likes the prior content that they saw earlier (or about to see later) in the test

Once the test is designed, the parameters (and the content-reels) are also stored in the cloud **245** so that the project can be deployed to various geographically-dispersed computers, i.e., individual stations, handheld devices, and the like, generally represented here by **205a-c**, in fact, in another embodiment, the system and method of the invention also involves using the cloud infrastructure for the creation of demographic allocation tables for distributing quota tables (workload) to various geographic locations.

As such, the content and parameters for the project are transferred from the cloud to the remotely located stations **205a-c** via links **220a-c**. The sensors **210a-c** are connected to the stations **205a-c** via wired or wireless links **215a-c**. While three stations are shown in FIG. 1, the present invention contemplates a system that incorporates more or less stations. In one embodiment, a plurality of stations **205** are used in accordance with the invention. For example, the plurality may include at least two stations **205**. In another embodiment, the plurality may include at least five stations. In yet another embodiment, the plurality may include at least ten stations. In contrast, the system may include a single station **205**. In another embodiment, the system may consist of at least one portable station **205**. For example, a suitable portable station may include a laptop computer, a monitor, a mobile device, or any combination thereof.

Likewise, the data collected from the remote locations **205** are received and stored in the cloud **245** for processing (e.g., analyzing and reporting). In this regard, the biologically based and/or behaviorally based responses to the presentation by each participant at the geographically dispersed public computers are uploaded to the cloud storage and then transferred to a computer system **235** via link **240** for analyzing and reporting.

It is also contemplated that the cloud infrastructure is similarly capable of analyzing the data using any or all of the methods for predicting audience viewing behavior and measuring user experience for interactive activities described in U.S. Pat. No. 8,296,172 and co-pending U.S. patent application Ser. No. 12/749,376, filed Mar. 29, 2010, Ser. No. 12/426,259, filed Apr. 19, 2009 and Ser. No. 13/089,752, filed Apr. 19, 2011, the entire disclosures of which are incorporated herein by reference, are contemplated for use in analyzing the data collected with the system and method of the present invention. The present invention also contemplates using the cloud infrastructure to aggregate across data acquired from various locations (and for various participants) and creating meaningful analytics insights/reports for specific content.

In another embodiment, the cloud infrastructure includes a neurological database that aggregates reports from various projects into database silos based on category, industry, client, brand, neurological measure, and the like.

Different types of software modules are contemplated for the sensus station versus the cloud. In general, the software modules contemplated by the system of the present invention may include, but are not limited to, at least one neurologically based signal recording module, a signal checking module for quality control, a communicator module, a screening module, a survey module, a content player module, an experience manager, and a syncing/transferring module.

For example, the neurologically based signal recording module may be a module for "controlled" starting and

stopping of facial-Video recording (using a webcam at the remote location) during reel play of the target content. In addition, the neurologically based signal recording module may include an sdk module to start and stop eye tracking from an eye tracker.

In sum, as generally illustrated in FIG. 1, a participant using a remote station puts on the biometric sensor device. The software at the remote location/station performs quality control checks and guides the participant/administrator through a series of steps to correct any issues with the sensor device. Once the biometric signals are deemed valid, the participant is guided to a screener section to specify the demographics of the participant to determine a stimulus/presentation to be shown to the participant.

The station then shows and simultaneously times the various pieces of content-stimuli associated with the particular presentation in addition to recording the biometric signals during the presentation. At the end of the session, the system walks the participant through any optional surveys that need to be completed. An additional quality control step to check whether the signals were valid for the participant during the presentation is then employed. The folder for the session/presentation may be automatically uploaded (at the end of presentation) or scheduled for upload to the cloud at a predetermined time. In one embodiment, the folder may include content (reel runs) timings, biometrics, demographics, participant's video (for computing facial expressions), eye tracking info, and any other associated data. Once the folder and included data is in the cloud **405**, it may be aggregated across different participant sessions and to analyzed using specific software for the biometrics and self-report, as well as software for eye tracking and facial coding, and Visualization software.

While those of ordinary skill in the art would recognize that other modules/steps not specifically mentioned may be incorporated into the workflow modules, FIG. 2 provides one embodiment of the overall workflow/modules of the system of the present invention with remote administration of a presentation/stimulus to participants with biometric monitoring.

In particular, as shown in FIG. 2, the remote location (shown here as **305**) may include a software module **320** for the remote location, unit, or station **305**. In this regard, the module **320** may include a Sensus software application **325** that, itself, may include various subset modules. In addition, the module **320** may include functionality to receive and process the data from the sensor **310**. In one embodiment, receiver module **390** may be Bluetooth or other wireless networking software or the like that transmits the data collected with the sensor **310** to the software module **320** as streaming raw data. The raw data in **390** may be dumped into a first processing module **392** that processes/converts the data (e.g., from r-r intervals to HR) and sends to second processing module **395** for further action. In particular, the second processing module **395** aggregates the data into smaller sampling units. The database **380** stores the specific data **382** after aggregation.

A communicator module **360** checks the data in the database **380** at predetermined periodic intervals to determine whether the signals being collected are within acceptable ranges, creating a feedback **362** that is provided to the user interface **320**. The user interface **322** includes a display that demonstrates proper functioning of the sensor **310**, remote station **305**, and other elements of the system. For example, if the heart rate signal being collected is flat, the user will receive instructions via user interface **320** to modify the attachment means for the sensor **310** by reposit-

tioning, tightening, or changing the attachment means or replace the sensor **310**. As discussed in greater detail herein, the attachment means may vary based on the sensor. Any suitable apparatus that allows the sensor to contact the user is contemplated. For example, if the sensor is to be wrapped about the arm of the user, the attachment means may be a strap, a sleeve, or the like. This quality control loop between **310**, **380**, **360**, and **322** will continue until the system is functioning as expected (i.e., the signals are within acceptable parameters). If after multiple attempts to adjust the attachment means and/or sensor do not result in the signals being within acceptable parameters, the audience member/user is released and the data collection is reinitiated with another audience member/user. This module simplifies the quality control check over other conventional neurological devices. Accordingly, administrative personnel with little to no training may operate the system of the invention.

After a successful quality control check, the user demographic information (discussed in greater detail below), is collected at **325**. The demographic information is relayed to a central (remote) server that manages the capacity for each content-reel and demographic segment, determines the specific content reel to be played, and obtains the specific content reel from the server. In one embodiment, the specific content reel includes a baseline segment, a context segment (e.g., a program or movie trailer), buffer advertisements, anchor advertisements, target content **334**, and various combinations thereof. In this context, the target content **334** may include target advertisements. In another embodiment where the target content **334** are target program trailers, movie trailers, or the like, the specific content reel **334** includes a baseline segment, target content **334**, buffer advertisements, anchor advertisements, and various combinations thereof. The content player module **330** will then play the specified content reel including the target content **334** for the demographics collected at **325**.

The project definition **410**, which will use a predefined set of rules/tables (discussed in greater detail below) relating to the collected demographic information in **325** as shown in **420**, to determine suitable target content to be played by the content player **330** (**334**), as well as the set content reels for the project. The project definition is a replica of the project definition **410** in cloud **405**, which also contains a demo quota manager **420**. The project definition **410** is pushed to the remote station **305** and operated by the software module **320** via **400**. In addition, the content player module includes pre- and post-surveys **332** and **336** that require user input. The target content **334** and the content player reel run log containing timing information is sent to the replica session data folders **415** in the software module **320** and later synched to the session data folders **415** in cloud **405** via **400**.

A recording module **375** may include eye tracking capability, video recording capability, static image recording capability, EEG recording capability, and combinations thereof. For example, the recording module **375** may receive a first signal from the content player **330** that the target content **334** will begin. The first signal will trigger the start of the recording. Likewise, once the target content **334** stops, a second signal received by the recording module **375** will stop the recording module from acquiring further data. The recording module is operatively connected with the session data folders **415** so that the data collected from **375** may be synched/transferred from the session data folders **415** to the cloud **405** via **400**.

The administrator module **340** may include an archive/data transfer to transfer the data from **360/362** into the session data folders **415** for eventual synching/transferring

to the cloud **405** via **400**. A closing session message will appear in **344**. The actual transfer/synching of data in the session data folders **415** to the cloud **405** is performed in **346**. The server update **348** may include notes from the administrator about the overall session, an automatic update from the Sensus software application **325** after performing a session level quality control check to indicate whether the biometric data collected during the reel play in **330** was acceptable. Based on this update, the demographic quota tables (discussed in greater detail below) will be updated (as one less participant to recruit for that demographic). The sensor status **350** may include administrator notes about the sensor (including any problems with the sensor or the sensor attachment means) during the session. The module **346**, which synchronizes the data with the cloud **405**, may happen at the completion of an audience member/user session (providing the data collected is not too large for transfer) or during a period of inactivity. Once transferred, the session data folders in software module **320** are marked as transferred and queued for deletion at a later, predetermined time.

The software module for the cloud **405** may include software for project creation (to create reels or presentations) which would be stored in project definition folders **410** for synching/transferring to the software module **320** when needed. In addition, the software module for the cloud **405** may include software for project deployment, tracking (e.g., a dashboard), analytics and visualization, and other software to perform the methods described in U.S. Pat. No. 8,296,172 and co-pending U.S. patent application Ser. No. 12/749,376, filed Mar. 29, 2010, Ser. No. 12/426,259, filed Apr. 19, 2009, and Ser. No. 13/089,752, filed Apr. 19, 2011. For example, tracker software may allow project coordinators to track general details of a specific project, e.g., general deployment, demographic quotas, and the like, as well as specific details for a station, e.g., active or in-progress sessions, reports. In addition, the tracking software may allow a particular station or terminal to be added, deleted, or modified.

The Presentation (or Stimuli)

The presentation may consist of a mixed sequence of content stimuli, self-report surveys (before and after the presentation of content stimuli). The presentation may include, but is not limited to, the following types of content stimuli:

1. Baseline content including a variety of standard images (modeled after the International Affective Picture System (IAPS)), standard video content to evoke a range of emotions for the audience, and optional standard web content to evoke a range of web experiences;
2. Specific content for context including television programs such as Everybody Loves Raymond that are typically aired during prime-time programming;
3. Anchoring commercials, which include standard commercials (non-target) that are inserted into multiple studies to "normalize" across different audience segments and standardize scores; and/or
4. Target content, which includes specific commercials, programs, movies, websites, and the like to be tested/studied for performance/success.

For example, in one embodiment, the target content is a television show. In another embodiment, the target content is a website or page of a website. In addition to content stimuli, the demographics of audience members may be determined through a screener or other suitable method. In this aspect, a 'pre'-survey to assess the inclination toward

client branding before the target content is presented and/or a post-survey to assess the same post-presentation is also contemplated.

Geographic Consideration

In one embodiment, the system is capable of identifying its geographic location including, but not limited to, city, zip code, state, county, longitude and latitude and any specific ID that is unique to a location. This advantageously allows the client to expose various content stimuli to audiences in different geographic areas. The system may also be capable of aggregating the number of responses for a particular geographic region, or for a combination of geographic region and targeted demographics. The geographic area may be predefined, or programmable. For example, a predefined region of the south east United States may include all data from Florida, Georgia, South Carolina, North Carolina, Alabama, Tennessee, Mississippi, and Virginia. In the alternative, a client may define a region, such as a specific radius surrounding a city. The system is capable of determining whether it is located within the specified boundaries. Which further refines the geographic analysis of the data collected. In one embodiment, the system aggregates the number individual audience members exposed to the stimulus in a geographic area. According to one aspect, a predefined number of audience members may be set for a particular content stimulus in a particular geographic area. In one aspect, the system may not consider audience members that have invalid signals during the presentation (in the predefined number/quota to be reached). For example, if an audience member has a "flat" skin conductance response for specific durations of the stimuli, it would be considered invalid. Similarly, if the heart rate data is above and/or below a set threshold, e.g., below 30 beats per minute (bpm) and above 190 bpm, the signal would be considered invalid. Once the predefined number has been reached, the system displays an alternate content stimulus. According to one aspect of the invention, the system is capable exposing specific content for a specific geographic region. For example, a regional advertiser may specify that an advertisement only be shown in kiosks within a specific region of the country. In addition, the system is capable of generating and sending a notification when a predetermined number of participants for a particular geographic area is reached.

example, the system is capable of receiving targeted demographics, such as women aged 18-34, and displaying a particular content stimulus to audience members within the targeted demographic. When a predefined number of responses for a targeted demographic have been reached, alternate stimulus content will be displayed to subsequent members of the targeted demographic. In addition, the system is capable of generating and sending a notification that a predetermined number for a particular demographic category area has been reached.

According to one embodiment, the system is capable of receiving demographic information for a particular location. For example, based on information obtained through the census or another source, the system may be able to receive information including any of the demographics discussed above. The system can allocate a threshold value for each targeted demographic category in proportion to the density of the demographic category in a specific location. In the alternative, the system can allocate the threshold number for a demographic category equally in each location. In addition, the system can receive the threshold value at any time before, during, or after interaction with an audience member.

In one aspect of the invention, the system can show different content for different targeted demographic population. Since the demographics can be distributed across various geographical regions, the system can divide the pre-defined quota of demographics across the regions. For example, as shown below in Table 1, a client may specify a specific quota for a targeted demographic. The system would then distribute this "quota-to-fill" across different geographic locations such as in Table 2.

TABLE 1

Audience Member Quota to Fill								
	Male	Female	Young	Old	Core	Non-Core	Reel	Subject-Ranges
Male	30	X	15	15	ANY	ANY	1	1-45
Fem	X	30	15	15	ANY	ANY	2	30-60

TABLE 2

Audience Member Quota Allocated to Each Location									
Location	Gender	Male	Female	Young	Old	Core	Non-Core	Reel	Subject-Ranges
Boston	Male	30	X	15	15	ANY	ANY	1	1-22
Boston	Fem	X	30	15	15	ANY	ANY	2	30-45
LA	Male	30	X	15	15	ANY	ANY	1	23-45
LA	Fem	X	30	15	15	ANY	ANY	2	46-60

Demographic Consideration

In one embodiment, the system is capable of identifying and aggregating demographic information. For example, the system may prompt a user to identify at least one of age, gender, race, employment status, education level, or other demographic category. According to one aspect, the system is capable of receiving a predefined limit or threshold value for each demographic category and aggregating responses for each demographic category. The system displays an alternate stimulus to audience members of a specific category once the predefined limit for the category has been reached. In one embodiment, the system is capable of combining one or more demographic categories. For

In one aspect of the invention, the quota may be pre-distributed equally (or based on capacities of the locations) across locations that can cater to the targeted demographics. In another aspect of the invention, the quota may be managed by as central server and allocated on a one-by-one basis per request.

According to one aspect of the invention, the system is capable of reporting all of the measured data (e.g., unconscious biologically based signals including, but not limited to, heart rate, skin conductance, eye-tracking, facial expressions, and EEG) for any combination of demographic category and geographic region.

### Additional Features

The system is operable to report the measured unconscious biologically based responses, as well as the geographic and demographic data collected. According to one aspect, the system is operatively connected (e.g., wired or wireless) to a server. The server may be operatively connected to a centrally located processing computer that conducts an analysis of all of the data gathered and generates a report of the results. In addition, each individual system may be operatively connected to other individual systems in different locations. For example, a kiosk located in Miami may be operatively connected to a kiosk in a Fort Lauderdale via the cloud infrastructure shown in FIG. 1.

In one embodiment, the system is operable to aggregate the data collected for each system and for an entire network of systems. In addition, the system is capable of aggregating data for each geographic area and demographic category. According to one aspect of the invention, the aggregation rate is programmable into the system. For example, the system may be set to aggregate data on a daily basis, weekly basis, or monthly basis, or immediately after each audience member test. Thus, an analysis of the data may be made over specified time periods further enhancing the ability to interpret the results.

According to one aspect of the invention, after aggregating data for a specified period, the system is capable of sending a report. The report may include demographic data including the number of audience member participants in any demographic categories that are below a set value. In one embodiment, the system is capable of generating a request for more participants in the deficient category. For example, the system may generate an audio and/or visual advertisement that is displayed to entice members of a deficient category to participate. The advertisement may be of any form including signs, text messages, print, social media, video, audio, and combinations thereof. According to one aspect, the system creates a prompt, instructing an administrator to pursue participants according to a specified need, such as a deficiency in a particular geographic area or demographic category.

In addition, the system may be equipped with the capability to generate incentives and rewards. For example, as a reward or incentive to attract an audience member, the system may be equipped with a printer or similar technology that can automatically generate a coupon, voucher, or gift card. By way of example, a system programmed to display a movie trailer may be capable of supplying vouchers for a free item from the snack bar, or discounted movie tickets. The vouchers are not limited to printed paper, but may also be emailed or electronically transmitted to an audience member. Preferably, the system is programmable to alter (type, amount, or number) the reward or incentive as desired. In one embodiment, the system may offer an audience member a choice from a variety of rewards.

### Method

The present invention also directed to a method of obtaining unconscious biological response data, eye-tracking, facial coding, EEG, and other measurements in response to a stimulus. The method may be implemented through the use of the system described above, or in any suitable manner. Preferably, the method is implemented through the use of a self-contained system, such as a kiosk or smart phone, as shown in FIG. 1.

The method includes several steps discussed in greater detail below. However, the order of performing the steps is not limiting, and the method encompasses the steps performed in any logical sequence. In addition, while the

method described below does not specifically include a detailed description of the use of the cloud infrastructure, it is contemplated that the cloud infrastructure is incorporated into the method of the invention.

FIG. 3 illustrates an embodiment of the steps of the method. In step 100, at least one biologically based sensor is provided. The sensor is operable to measure at least one unconscious biological response including, but not limited to, galvanic skin response (GSR), heart rate, respiration, and movement. Preferably, at least two unconscious biologically based responses are measured. According to one aspect of the invention, the biologically based sensor comprises one or more wearable devices such as “smart” garments, wrist bands, shirts, sleeves, arm bands, cameras, watches, and head-gear. In a preferred embodiment, the biologically based sensor is unobtrusive and easily removable, such as an arm band. In accordance with one aspect of the invention, step 100 further comprises providing one or more sensors or devices capable of monitoring eye movement and/or pupil dilation. In addition, step 100 may also include providing one or more self-reporting devices including, but not limited to, mouse, keyboards, knobs, buttons, sliders, touch screens, voice recognition technology, and variations thereof. Moreover, step 100 may also include providing one or more video or image recording devices to capture facial expressions and other neurologically based signals that may be incorporated into the analysis with the collected biometric data.

In step 105, a computer system is provided. The computer system may be the system shown as 205 in FIGS. 1 and 305 in FIG. 2. The computer system is operatively connected to at least one biologically based sensor(s) as provided in step 100. In addition, the computer system is operable to receive data from the biologically based sensor(s) and any additional sensors or devices. The computer system also contains a memory for storing data collected by the system. Furthermore, the computer system is capable of sending and receiving data. Preferably, the computer system is operatively connected to a server or cloud. The connection may be wired or wireless and may employ any connection available to a skilled artisan. According to one embodiment, the computer system is operatively connected to a display device 105a. As discussed above, the display device comprises at least one of televisions, LCD screens, touch screens, 3-D displays, movie screen, head-mounted displays, plasma screens, a desktop, hand-held or wearable computer device, gaming console, home or portable music device, or any other device for the presentation of passive or interactive audio, visual or audio-visual presentation.

According to one aspect of the invention, the computer system, biologically based sensors, display device, self-reporting device, and any additional sensors are provided in a self-contained system, such as a kiosk.

The system, which preferably includes the computer system, a display device, and the biologically based sensor(s), receives at least one stimulus in step 110. As discussed above, the stimulus may comprise a sensory stimulus, presentation, or interactive activity that can include an audio, visual or audio-visual stimulus, such as a sound or sequence of sounds, a picture or a sequence of pictures including video, or a combination of one or more sounds and one or more pictures, including video. According to one embodiment, the system receives at least two stimuli. The system may combine the target content/stimuli with other “reference” and “baseline” content/stimuli to make the measurements on the target content/stimuli comparable to prior target stimuli and create scores in analysis. In fact, any of the methods for predicting audience viewing behavior and

measuring user experience for interactive activities described in U.S. Pat. No. 8,296,172 and co-pending U.S. patent application Ser. No. 12/426,259, filed Apr. 19, 2009 and Ser. No. 13/089,752, filed Apr. 19, 2011. In one embodiment, the target content/stimuli and any other reference and baseline content may be delivered to the system via the cloud.

According to one aspect of the invention, the system receives the geographic location from a location device, such as a GPS device. In one embodiment, the system receives demographic information about individual members of the audience.

An audience member is exposed to the content stimulus in step 120. The exposure is preferably via an audio and/or visual display device operatively connected to the computer system. In one embodiment, each audience member is exposed to a stimulus individually. In the alternative, a plurality of audience members may be exposed to the stimulus simultaneously.

While the audience member is exposed to the stimulus, the sensors (including biologically based sensors, eye trackers, and self reporting devices) obtain data in step 130, which may be stored on the computer system. The data may be transmitted to the server or cloud for analysis at a central processing facility in step 135. The data, results, and/or analysis may be included in a report in step 140.

In addition to the steps discussed above, several intermediary steps may also be included in the method. For example, according to one aspect, the system receives specific criteria related to each geographic area and demographic category, such as a desired number of participants in each area and category. In addition, the system aggregates the number of audience member participants in each category, area, and combinations thereof. When a preset number of audience member participants within a specific category, area, or combination thereof has been reached, the system offers alternative content to members of that category, area, or combination thereof. For example, the system may receive a limit of 100 participants for the category "18 to 34 year old females within 90 miles of Atlanta" for a particular movie trailer. Upon reaching the limit of 100 participants, the system will no longer display the movie trailer, and may offer a different movie trailer or other content.

Likewise, any steps that fit within the description of the systems shown in FIGS. 1 and 2 with regard to the software driving the remote systems, the analysis of the data, and the transfer to/from and storage of data to the cloud are contemplated as a part of this invention.

In one embodiment, the method includes a step of reporting a deficiency in a specific category, area, or combination thereof. Thus, the method may also include a further step of enticing members of the deficient category, area, of combination thereof by generating an advertisement, incentive, or reward for participation. In addition, the method may also inform an administrator of a deficient category, area, of combination thereof and prompt the administrator to recruit members of the deficient category, area, of combination thereof.

## REPRESENTATIVE EXAMPLES

### Example 1

The following examples are provided to illustrate an embodiment of the system and method of the present

invention. The example is intended to be merely illustrative, and does not limit the scope of the claims to the embodiment presented in the example.

A kiosk is equipped with several components including biologically based sensors, cameras, computer system, touch screen, mouse, LCD display, GPS device, and wireless internet connection. All of the components are connected to the computer system. The sensors are housed within an arm band.

A movie production company desires to test a portion of two new movies in an effort to determine whether the movies will be successful, and what response the audience will have to two different version of the movie trailer. The kiosk is placed in a movie theatre lobby. The movie company is particularly interested in the response of females ages 18-34 for the first movie. The first movie clip is received by the kiosk via the wireless connection. In addition, the second movie that is targeted at men ages 18-34. A second movie clip for the second movie is received by the kiosk and stored on the computer system via the wireless connection. The movie company determines that a sample size of 100 individuals within the targeted demographic would provide sufficient test results. The kiosk receives the "100 individuals" goal for the targeted demographic for each movie clip.

In an effort to generate participation in the study, the kiosk displays an advertisement for a free popcorn voucher for audience members. Members of the public approach the kiosk and are prompted to enter their age and gender (or any screening criteria) using the touch screen (or other data entry device). The audience members are then prompted to attach the arm band and are shown the movie clip on the LCD display. Women 18-34 are shown the first movie clip and men 18-34 are shown the second movie clip. Anyone outside the targeted demographic may not be included in the testing at all, or alternatively are shown either movie clip. The unconscious brain response data is obtained by the biologically based sensors and the audience member's eye movements are tracked by the camera.

As the data is acquired for each audience member, the data is sent (immediately or deferred) via the wireless connection to a central processing server for analysis and reporting. The analysis may also be made by the computer system and subsequently reported to a central location. In addition, the computer system generates a daily report indicating the number of each demographic that has participated.

After a week, the second movie clip has been shown to over a 100 men ages 18-34. However, the first movie clip has only been shown to 70 women ages 18-34. Thus, the kiosk receives instruction to recruit women ages 18-34. In response, the kiosk generates an advertisement specifically targeting women ages 18-34.

### Example 2

Several kiosks described above in Example 1 are deployed in various locations throughout the country. A movie production company desires to test a portion of two new movies in an effort to determine whether the movies will be successful, and what response the audience will have to the portion of the movies. The kiosks are placed in a movie theatre lobbies across the country.

As in the first example, members of the public approach the kiosk (or are recruited by a kiosk manager), and are prompted to enter their age, gender, and various other demographics using the touch screen. The audience mem-

bers are then prompted to attach the arm band and are shown the movie clip on the LCD display.

The movie production company is particularly interested in determining interest in the movie clip from participants within a 90 mile radius of Atlanta, Ga.

The system aggregates the demographic data as well as the overall number of participants. In addition, using the location information, which may be provided by a UPS device, the computer system can calculate the distance of the kiosk from Atlanta, Ga. The system generates a report of the aggregated data and transmits the report via the wireless interact connection. In addition, the system reports the data and information related to participants that were tested at a kiosk within 90 miles of Atlanta, Ga.

The system receives a request from the movie company that the company desires at least 1000 participants from the Atlanta area. The system reports the number of participants on a daily basis. However, after a week, there have only been 500 participants from the Atlanta area. The system receives instructions to generate an advertisement in the Atlanta area for participants and generates movie vouchers as an incentive.

### Example 3

Several kiosks described above in Example 1 are deployed in various locations (such as movie theatre lobbies and malls) throughout the country and around the world. A movie production company desires to test two or more versions of a movie trailer in these locations to determine which version of the trailer will be most successful in each specific location.

As in the first and second examples, members of the public approach the kiosk (or are recruited by a kiosk manager), and are prompted to enter their age, gender, and various other demographics using the touch screen. The audience members are then prompted to attach the arm band and are shown the movie clip on the LCD display.

The system aggregates the demographic data as well as the overall number of participants. In addition, using the location information, which may be provided by a GPS device, the computer system will determine which version is successful in each location. The system generates a report of the aggregated data and transmits the report via the wireless interact connection.

Should the system receives a request from the movie company that the company desires to retest the trailer versions on specific recruits, based on income, gender, age, and the like, the system may generate an advertisement on the kiosk screen for the specific demographic that the movie company desires and retest.

A skilled artisan would recognize that the examples provided above are merely illustrative and not intended to limit the scope of the invention. For example, the system and method may be used to measure response to a wide array of content stimuli, and is not limited to movie trailers. In particular, such kiosks may be employed in other locations to test advertisements using the same general protocol.

Although the present invention has been described with reference to particular embodiments, it will be understood to those skilled in the art that the invention is capable of a variety of alternative embodiments within the spirit of the appended claims.

What is claimed is:

1. A system for adaptively presenting a target stimulus to a remotely located audience comprising:

a processing computer operatively connected to a cloud infrastructure, the processing computer capable of creating and storing a content reel and project parameters, the content reel including at least target content and baseline content, the cloud infrastructure to receive the content reel and the project parameters from the processing computer and send the content reel and the project parameters to a plurality of remote units in geographically diverse locations;

a first remote unit of the plurality of remote units, wherein the first remote unit includes:

a first biologically based sensor to measure first unconscious responses for a first audience member;

a first processor to receive first data representative of the first unconscious responses for the first audience member from a first location; and

a first display, the first display and the first biologically based sensor operatively connected to the first processor, the first processor further including a first remote memory to receive and store the content reel and project parameters from the cloud infrastructure, the first processor to expose the first audience member to the content reel on the first display, the first processor to transmit the first data representative of the first unconscious responses collected from the first audience member in response to the content reel and first demographic information collected from the first audience member to the cloud infrastructure, the first demographic information including a demographic category;

wherein the first remote unit is to receive a first capacity value for a first demographic category and first location for the content reel and send the first capacity value to the processing computer via the cloud infrastructure, the processing computer is to transmit an alternate content reel to the first remote unit via the cloud infrastructure, the first remote unit to expose the first audience member to the alternate content reel on the first display when the first capacity value is obtained, the alternate content reel including alternate target content and alternate baseline content, and

a second remote unit of the plurality of remote units, wherein the second remote unit includes:

a second biologically based sensor to measure second unconscious responses for a second audience member;

a second processor to receive second data representative of the second unconscious responses for the second audience member from a second location; and

a second display, the second display and second biologically based sensor operatively connected to the second processor, the second processor further including a second remote memory to receive and store the content reel and project parameters from the cloud infrastructure, the second processor to expose the second audience member to the content reel on the second display, the second processor to transmit the second data representative of the second unconscious responses collected from the second audience member in response to the content reel and second demographic information collected from the second audience member to the cloud infrastructure, the second demographic information including a second demographic category;

wherein the second remote unit is to receive a second capacity value for a second demographic category and

second location for the content reel and send the second capacity value to the processing computer via the cloud infrastructure, the processing computer is to transmit the alternate content reel to the second remote unit via the cloud infrastructure, the second remote unit to expose the second audience member to the alternate content reel on the second display when the second capacity value is obtained, the alternate content reel including alternate target content and alternate baseline content, and

wherein the system is capable of analyzing the first data, second data, first demographic information and second demographic information received by the processing computer from the cloud infrastructure to generate a report including a comparison of responses to the target content to the baseline content or the alternate target content to the alternate baseline content.

2. The system of claim 1, wherein the first and second unconscious responses include one or more of skin conductance, heart rate, respiration, EEG, or head movement.

3. The system of claim 2, wherein the first processor is to transmit to the cloud infrastructure third data representative of a third unconscious response collected from the first audience member in response to the content reel, and the third unconscious response includes one or more of facial expression, or eye tracking.

4. The system of claim 3, wherein the third remote unit includes a remote location software module including a recording module to obtain the third unconscious response.

5. The system of claim 4, wherein the recording module includes one or more of a camera, a video recorder, or an eye tracker.

6. The system of claim 1, wherein the system is capable of selecting the target content from a plurality of target content based on a plurality of factors, the plurality of factors including the first and second demographic information collected from the first and second audience members.

7. The system of claim 1, wherein the demographic category includes one or more of age, gender, race, income, or educational background.

8. A system for adaptively presenting a target stimulus to a remotely located audience comprising:

a processing computer operatively connected to a cloud infrastructure, the processing computer to create and store a content reel and project parameters, the content reel including target content, baseline content, and an additional unit of content, the cloud infrastructure to receive the content reel and the project parameters from the processing computer and send the content reel and the project parameters to a plurality of remote units in geographically diverse locations;

a first remote unit of the plurality of remote units, the first remote unit including;

a first biologically based sensor located in a first remote station to measure a first unconscious responses for the first audience member;

a first processor to receive first data representative of the first unconscious responses for the first audience member from a first location; and

a first display, the first display and the first biologically based sensor operatively connected to the first processor,

the first processor further includes a first remote memory to receive and store the content reel and project parameters from the cloud infrastructure, the first processor to expose the first audience member to the content reel on the first display, and the first processor to transmit the

first data representative of the first unconscious response collected from the first audience member in response to the content reel and first demographic information collected from the first audience member to the cloud infrastructure, the first demographic information including a first demographic category,

wherein the processing computer is to receive a first capacity value for the first demographic category and first location for a content reel, the processing computer is to transmit to the first remote unit through the cloud infrastructure an alternate target content, and the system is to expose a first audience member to the alternate target content when the first capacity value is obtained; and

a second remote unit of the plurality of remote units, the second remote unit including;

a second biologically based sensor located in a second remote station to measure second unconscious responses for the second audience member;

a second processor to receive second data representative of the second unconscious responses for the second audience member from a second location; and

a second display, the second display and the second biologically based sensor operatively connected to the second processor, the second processor further includes a second remote memory to receive and store the content reel and project parameters from the cloud infrastructure, the second processor to expose the second audience member to the content reel on the second display, and the second processor to transmit the second data representative of the second unconscious biological response collected from the second audience member in response to the content reel and second demographic information collected from the second audience member to the cloud infrastructure, the second demographic information including a second demographic category,

wherein the processing computer is to receive a second capacity value for the second demographic category and second location for a content reel, the processing computer is to transmit to the second remote unit through the cloud infrastructure the alternate target content, and the system to expose a second audience member to the alternate target content when the second capacity value is obtained, and

wherein the system is to analyze the first of data, the second data, the first demographic information, and the second demographic information received by the processing computer from the cloud infrastructure to generate a report including a comparison of responses to the target content or the alternate target content to the baseline content.

9. The system of claim 8, wherein the first biologically based sensor includes a first sensor operable to measure heart rate and a second sensor operable to measure galvanic skin response.

10. The system of claim 8, wherein the first remote unit includes a recording module to measure one or more of facial expression, or eye movements.

11. The system of claim 10, wherein the first processor is operable to transmit to the cloud infrastructure third data representative of one or more of the recorded facial expression, eye movements, or EEG collected from the first audience member in response to the content reel.

12. The system of claim 11, wherein the system is to analyze the first data, second data, third data, first demo-

graphic information and second demographic information received by the processing computer from the cloud infrastructure to generate a second report including a comparison of responses to the target content to the baseline content.

13. The system of claim 8, wherein the capacity values are distributed equally for each location. 5

14. The system of claim 8, wherein the additional content includes specific content, anchoring commercials, online web content, or on-line self-report surveys.

15. The system of claim 8, wherein the demographic category includes a plurality of categories including one or more of age, gender, race, income, or educational background. 10

16. The system of claim 8, wherein the first remote unit includes a first biologically based measuring device operatively connected to the first processor to track eye movement, the first processor to transmit data representative of the eye movement for the first audience member to the processing computer via the cloud infrastructure, and the processing computer is to receive and analyze data representative of the eye movement for the first audience member from a first location. 15 20

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专利名称(译)	用于在涉及远程存储和计算的分布式框架中收集和计算受众的基于神经学的反应的方法和系统		
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[标]申请(专利权)人(译)	INNERSCOPE研究		
申请(专利权)人(译)	INNERSCOPE研究, INC.		
当前申请(专利权)人(译)	尼尔森公司(美国)有限责任公司		
[标]发明人	KOTHURI RAVI KANTH V MARCI CARL LEVINE BRIAN		
发明人	KOTHURI, RAVI KANTH V. MARCI, CARL LEVINE, BRIAN		
IPC分类号	G06Q10/00 G06Q30/02 H04H60/33 A61B5/16 H04N21/24 G06Q30/00 A61B5/22 A61B5/11 A61B5/08 A61B5/053 A61B5/0476 A61B5/024 H04H60/45 A61B5/00		
CPC分类号	H04N21/24 A61B5/16 G06Q30/0201 H04H60/33 A61B5/0002 A61B5/02405 A61B5/0476 A61B5/0533 A61B5/08 A61B5/11 A61B5/1112 A61B5/225 A61B5/6897 H04H60/45 A61B5/163		
优先权	61/603521 2012-02-27 US		
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外部链接	<a href="#">Espacenet</a> <a href="#">USPTO</a>		

摘要(译)

用于通过远程监控来测量针对目标人口统计和位置中的内容的基于生物学和行为的响应的系统和方法。刺激可以基于位置，目标人口统计数据及其组合。

