

Technologies, Inc

BrainMaster Live sLORETA Brain Imaging & Biofeedback using a Normative Database

Thomas F. Collura

BrainMaster Technologies, Inc. & Brain Enrichment Center

Introduction

A new method for brain imaging was constructed by combining the sLORETA localization algorithm with a reference database. Using this approach, it is possible to reconstruct brain electrical activity in real-time, and produce accurate 3-D images of brain activation in a range of EEG component bands. All 6,238 voxels of brain activity are computed in realtime (8 frames per second) in 8 frequency bands, and converted into z-scores reflecting the instantaneous current-source density compared to a normative population.



Above: A live reconstruction and imaging using sLORETA. It depicts training within the Cingulate Gyrus.



Above: Z-scores reflecting the instantaneous current-source density compared to a normative population within Regions of Interest (ROI) and Network Z-Scores.

Methodology

The sLORETA algorithm was described by Pascual-Margui (2002), and the normative reference is based on the database first described by John et al. (2000). The examples that follow demonstrate its dynamic functionality.



Above: Genardi's Default Mode Network shown within 3-D reconstruction using a normative database.

Specific results are shown demonstrating the ability of this technique to isolate brain functional regions including networks and hubs, as a function of instantaneous brain state.

1. Individual State Patterns

In one case of extreme pain control, a hub of awareness was detected at the -3.0 zscore level.



In this image of gamma activity, a profound excess is found in the mesiotemporal regions, corresponding to an internalized state



2. Isolation of Brain Functional Regions

In other cases of extreme performance, individual patterns reflecting states of



3. Complementary Activation -Sender & Receiver Another example, in a case of energy healing, showed a unique pattern of



4. Ipsative Responses to Cues

Using BrainAvatar™, the process examines the asymmetry in the prefrontal cortex identifying gamma wave bursts to assess the underlying subconscious decisions behind these self-reported responses, at the verv moment of decision-making. This process provides scientific evidence that an evoked emotionally laden response results in corresponding brain activity and exposes the match to self reported explanations. The process documents both the intensity of human emotional response as well as the



Above: Dominant gamma wave activity in the left prefrontal cortex signifies acceptance & increased activity in the right represents avoidance (Bonstetter, et al., 2012a; Bonstetter, et al., 2012b)



Left: Focal deficit in Broca's Area in elderly an individual with a speech deficiency.

References

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Contact Information BrainMaster Technologies, Inc.: www.brainmaster.com Thomas F. Collura:



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lader Wellness Study Results: In the debriefing session, activ this participant, diagnosed with severe depression, direc revealed sleep deprivation, conflicts with healthy food & her love of chocolate chip cookies, as well as disclo spots on her lungs. She then opened up & began the proces

Discussion

Using BrainAvatar[™] the process examines the asymmetry in the prefrontal cortex identifying gamma wave bursts to asses the underlying subconscious decisions behi these self-reported responses, at the vermoment of decision-making. This proce provides scientific evidence that an evoked emotionally laden response results in corresponding brain activity and exposes the match to self reported explanations. The process documents both the intensity of human emotional response as well as the directionality of the response.

Results

Target Training International, (TTI) in cooperation with BrainMaster and their Brain AvatarTM software, have for the first time, turned the soft science of personal assessment into a hard science by showing not just what people say is their self reported ipsative response, but ung their answers with corresponding brain v, using GIVE, (Gamma for Ipsative on using Electroencephalography). The process uses asymmetric gamma wave bursts refrontal cortex to validate the underlying subconscious decisions behind these self reported responses, at the very moment of decision-making. vovides evidence that an evoked emotionally response results in corresponding brain that documents both the intensity and n of human emotional response.

> that she was recently told she had 2 dark reflecting upon the physical & mental implications.

> > This emerging technology using BrainAvatar[™] and patent-pending VIDE process allows TTI to not only validate and improve existing assessments, but to creat new approaches that expose the core beliefs behind ou behaviors, emotions, and daily decisions.

The EEG area depicted in green represents one stimulus event. Letter A represents the starting point of an event. Letter B indicates the point in the EEG when an online stimulus ends.

Methodology

The first step involves a person completing an online survey. Once that data has been analyzed, the client is connected to the BrainMaster BrainAvatar [™] and shown a word or image from the previous online assessment. These stimuli are on the computer screen for 1 to 1.5 seconds, followed by a 1.5 to 2 second blank screen. Next the asymmetry between the right and left frontal lobes are reviewed to determine the individual's reaction. Lastly, the BrainAvatar™ results are compared to