

UC San Diego Scientists Developing Brain Imaging Methods for Studying Natural Human Behavior

December 10, 2008

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The Swartz Center for Computational Neuroscience at UC San Diego will create a new imagining process to study human body/brain dynamics of subjects engaged in normal activity in ordinary room environments. The work, to be performed under a four year, \$3.4 million research grant from the U.S. Navy Office of Naval Research, aims at developing a concurrent brain and body imaging modality MoBI ("Mobile Brain/Body Imaging")

Explaining the project, the principal investigator, Swartz Center Director Scott Makeig, said, "Although functional brain imaging has allowed many new insights into human brain function, so far no imaging modality has allowed scientists to study brain dynamics of subjects performing normal activities in a 3-D environment. The MoBI modality we are developing under this project will allow such studies for the first time."

Makeig and colleagues propose to combine high-density, non-invasive electroencephalographic (EEG) or 'brainwave' recordings with full-body motion capture recording to explore the distributed brain dynamics that accompany and support natural human behavior, including interactions with objects, active agents, and other people.

Sub-projects of the research include experiments involving treadmill walking and running, pointing and reaching, balancing and juggling, route finding, gesturing and game playing. Collaborators on the project include Rafael Nunez, professor of cognitive science at UC San Diego, Daniel Ferris, University of Michigan, Kate Holzbaur of Wake Forest University, and Tzzy-Ping Jung of UCSD and National Chiao-Tung University in Taiwan. Jung and colleagues are also developing microelectronic brainwave processing systems that could soon be incorporated in wearable wireless MoBI systems.

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