New UCSD Center Explores Human Brain Dynamics

For Immediate Release

The Institute for Neural Computation of the University of California San Diego will open a new center, The Swartz Center for Computational Neuroscience, on November 16, 2001. A public open house will be held from 6 to 9 p.m. on November 14 during the Society for Neuroscience meeting in San Diego. Buses will be available to bring meeting goers to the Salk Institute, from where vans will shuttle guests to the Center open house.

Funded by The Swartz Foundation of Stony Brook NY, the Center will study human brain dynamics using novel computational analysis of functional brain imaging data. The Center is located in a 2,800 square feet suite in a medical office building adjacent to the UCSD campus. It will have office and computer resources for 16 scientists at all levels, from graduate students to visiting senior scientists, two EEG laboratories measuring brain electrical activity from the scalp, and a cluster of graphics workstations capable of rapidly testing the significance of dynamic models of functional brain data collected either at the Center, at the new UCSD/Salk Institute Center for Functional Magnetic Resonance Imaging, or in collaborating laboratories.

According to Scott Makeig, the director of the Center and Associate Research Scientist at UCSD, "In the last decade a new field, cognitive neuroscience of humans has come into scientific prominence because of technical developments in non-invasive brain imaging. In particular, our ability to study humans performing a wide range of cognitive tasks presents an unprecedented scientific opportunity to study how dynamic interactions between different parts of the brain support our cognitive abilities, social awareness and creativity." The Center will also expand ongoing efforts to record and interpret concurrent electromagnetic (EEG) and functional magnetic resonance imaging (fMRI) data. "We will combine the different kinds of information that different imaging modalities, such as EEG and fMRI, provide us," says Center Associate Director Tzyy-Ping Jung.

The Center's focus will be on exploiting this opportunity. It will bring together resources to allow its scientists and collaborators to contribute to advances in understanding the basic relationship between the human mind and brain. The Center's work will require new mathematical models of brain dynamics, new signal processing techniques based on these models, and new statistical methods to test them. One experimental goal is to study brain interactions that support social interactions. A second goal is to study our awareness of time and temporal relationships, which is intimately related to brain dynamics. A third area of interest is to study our ability to control our own brain rhythms, with potential clinical and/or workplace applications.
The new Center will be a laboratory of the **UCSD Institute for Neural Computation**, an organized research unit (ORU) of the University of California, directed by Terrence Sejnowski, a computational neurobiologist in the Department of Biology at UCSD and an Investigator with the Howard Hughes Medical Institute at the Salk Institute for Biological Studies. “There is now a real opportunity and an acute need to develop and apply new computational methods to derive information about how the brain works from the massive data sets produced by these new technologies,” said Sejnowski. “We are at the threshold of a new era in the study of who we are.”

A **Center dedication** and reception will be held on November 16. Dr. Jerome Swartz, Swartz Foundation Chairman, plans to attend. Dr. Swartz is Co-Founder and Chairman of Symbol Technologies, the Holtsville N.Y.-based global leader in barcode-based mobile data transaction systems. Under his leadership, Symbol was awarded the National Medal of Technology in year 2000. Swartz holds more than 150 U.S. patents. He is an IEEE Fellow, a member of the National Academy of Engineering, and a recipient of the 1998 IEEE Ernst Weber Leadership Award and the 2001 New York Academy of Sciences Eureka Award. Swartz is a board member at Stony Brook University and New York’s Polytechnic University. In his role as Symbol’s chief scientist, he has guided the Company’s research in Automatic Identification/pattern recognition laser systems (“eyes for the computer”).

**The Swartz Foundation** was established by Dr. Swartz in 1994 to explore the applicability of basic “hard” science principles to experimental neurobiology as a computational path to better understanding the brain/mind relationship. Research initiatives supported by the Foundation include five Sloan/Swartz centers for postdoctoral research, and targeted research projects at several US universities and research centers. Projects range from experimental investigations of brain circuitry to computational models of large neuronal systems. Foundation informational exchange programs include annual scientific conferences at the Banbury Center of Cold Spring Harbor, NY. Since 1996, the series’ core theme has been several scientific approaches to the study of consciousness. The Foundation also sponsors an annual Mind/Brain public lecture series at Stony Brook, in which distinguished scientists and thinkers present ideas in brain science.

**Data Acquisition and Computing.** Currently, the Center has a 72-channel EEG recording system built for use in or out of the fMRI environment, and hopes to acquire a 256-channel EEG system soon, with prospects for building the first very-high density non-contact electrometer for human brain studies. The initial Center computing facilities will include 32 1.7GHz CPUs running Linux, plus 0.5Tb online storage, expandable to 3.5Tb, and a full T1 connection to UCSD and the Internet.

**Functional Brain Imaging.** The Center is located less than a mile from the UCSD Medical School and its new UCSD/Salk Functional Brain Imaging Center, which will open in January with routine human data collection scheduled to begin in April, 2002. The Functional Imaging Center will house four high-field magnets, 3T and 4T human systems plus 4.7T and 7T monkey and rat systems. All systems will be Varian, allowing a common open software interface.
Contacts

The Center website will be located at sccn.ucsd.edu. For more information on the Institute for Neural Computation, visit its website at inc.ucsd.edu. The research website of Dr. Makeig, containing extensive references, papers and downloadable software, is currently at www.cnl.salk.edu/~scott/. Dr. Jung's web site is www.cnl.salk.edu/~jung/. For more information on the Swartz Foundation and its activities, visit its website at www.swartzneuro.org/.

The street address of the new Center is:

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