to enable noninvasive, personalized remote health care, real time, high-content phenotyping, and longitudinal follow-up.

The center will also develop and apply advanced computational approaches to analyzing the flow of information, and create smart databases interfaced with online data mining, allowing the translation of advances in neuroscience into health care in the clinic, the workplace, and the home. Advanced statistical methods, including independent component analysis, will be employed to enable high-throughput feedback to the subject and a reduction of health care costs. These approaches will facilitate diagnosis, monitoring of treatment efficacy, and prediction of outcome for neurological diseases such as Parkinson's disease, Alzheimer disease, Huntington disease, Down syndrome, Lou Gehrig's disease, cerebral palsy, sleep disorders, stroke, and traumatic brain injury.

The Center for Advanced neurological Engineering will create a leading effort for understanding and treating the nervous system in order to improve the lives of individuals afflicted with neurological diseases.

(Left) CT scan of a patient with implantable electrodes. (Middle) Mathematical model of the brain. (Right) Source of epileptic seizure. Red represents positive potentials and blue negative ones.

Center for Advanced Neurological Engineering

Co-Directors

William Mobley
Professor and Chair of Neuroscience

Tzyy-Ping Jung

Senior Research Scientist, INC, and Co-director, Swartz Center for Computational Neuroscience

Operated jointly by the Institute of Engineering in Medicine and the Institute of Neural Computation

The mission of the **Center for Advanced Neural Engineering (CANE)** is to integrate the abundant expertise in neural engineering and computation at UCSD with basic scientific and clinical knowledge of the nervous system to improve the diagnosis, treatment, and prevention of neurological diseases and injuries. The center will characterize and clarify neuropathogenic processes, create and apply innovative technologies for advanced neuroscience research, and develop novel methods and strategies to create new ways for improving the lives of patients with neurological disorders.

The center will focus on novel approaches to recording and modeling brain activities and body functions, including the combination of electroencephalographic, electromyographic, behavioral, and physiological measures. Emerging microelectronic technologies will be used to develop human noninvasive, high--density, multimodal, mobile brain/body imaging and analyses, and implantable applications of closed--loop systems. The center will enable wireless transmission of a patient's health status and their needs to health providers