VirginiaTech
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Computer Science Seminar Series, 2011

National Capital Region

Pattern Recognition in Brain Imaging

Speaker: Dr. Carlton Chu
Section of Functional Imaging Method,
Laboratory of brain and cognition,
National Institute of Mental Health,NIH

Friday, April 29, 2011
1:00PM-2:00PM, NVC 325

Abstract

Brain images enable us to study the function and structure of brains. There have been increasing interests of applying machine learning and pattern recognition method to brain images. Unlike other applications, brain imaging data are very high dimensional, and a lot of regions in the brain are highly correlated. Modern machine learning method can handle such high dimensional data, and train a classifier to make diagnosis to diseases such as Alzheimer's diseases. We can also use the same technology to learn the pattern of functional activation, and make prediction of the subject's cognitive state (a.k.a. brain decoding).

Biography

Dr. Carlton Chu is a research fellow in brain imaging at the National Institute of Mental Health (NIMH), NIH. He received the B.Eng. degree (1st class Honours) from Auckland University, New Zealand, in 2002 and the master of Biomedical Engineering from University of New South Wales, Australia, in 2004. Carlton obtained a PhD in Neuroimaging method from University College London in 2009, working in the statistical methods group at the prestigious Wellcome Trust Centre for Neuroimaging, creators of the famous 'SPM' program, the de-facto standard analysis tool for neuroimaging used around the world. There he developed innovative new pattern recognition methods to automatically detect the early stages of neurodegenerative diseases such as Alzheimer's and Huntingdon's just from structural brain images. In 2007, Carlton won the first prize in the 2nd Pittsburgh Brain Activity Interpretation Competition (PBAIC), a prestigious international competition involving the application of machine learning to the problem of classification of brain activity. He led a small research team to victory, acclaim from peers in the field, and the $10K first prize. His current research interests include brain state decoding, neurodegenerative disease classification, and applying Bayesian method to brain images.