



CLINICAL IMAGING RESEARCH CENTRE SINGAPORE

A joint venture between the Agency for Science, Technology And Research (A*STAR)
and the National University of Singapore (NUS)

The A*STAR-NUS Clinical Imaging Research Centre (CIRC) Presents Weekly Journal Club/Lab Meeting

March, 2016

Time: 2:00pm – 3:00pm, Wednesday

Venue: CIRC Conference Room
Clinical Imaging Research Centre (CIRC)
Centre for Translational Medicine (MD6)
14 Medical Drive, #B1-01
Singapore 117599

Date	Speakers	Topic
02/03/2016	Wei Hou Tan	"Amyloid PET in Alzheimer's disease"
09/03/2016	Susanne Haber*	"From primate anatomy to human neuroimaging: Linking circuits to psychiatric disease and neurotherapeutic targets"
16/03/2016	Chun Kit Wong	"Quantitative magnetization transfer: theory and application"
23/03/2016	Nanbo Sun	"Latent Factors in Mental Disease"
30/03/2016	Ngo Hoang Gia	"Large-scale automated synthesis of human functional neuroimaging data"

* Venue: MD6-01-01B



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Speaker Background

Wei Hou Tan:

Research Assistant of CIRC. Bachelor of Science (Honours) in Physics (NUS class of 2013).

Susanne Haber:

Professor

Department of Brain and Cognitive Science

University of Rochester School of Medicine and Dentistry

Abstract: Prefrontal regions (PFC), dorsolateral and ventrolateral PFC, dorsal anterior cingulate, cortex orbitofrontal cortex, and ventromedial PFC, and their connections play a central role in reward and decision-making. These areas, along with their white matter pathways, are closely associated with several psychiatric disorders, including depression, schizophrenia, obsessive-compulsive disorder, and addiction. While their projections define the functional regions of cortex and basal ganglia, these terminals also interface in specific locations with those from other functional areas. The first part of this talk will address the organization of PFC terminals in the striatum and cortex, demonstrating regions that serve to integrate information across regions. Fibers from the PFC travel through several white matter bundles that show changes in volume and diffusivity in several psychiatric disorders. Diffusion MRI tractography provides only indirect information about white matter that require validation based on animal tracing data. The second part of the talk will address the relationship between connectivity specificity demonstrated with animal tracing experiments and diffusion tractography in both animals and humans. Finally, an invasive surgical target for depression and obsessive-compulsive disorder is the internal capsule.

The last part of the talk will demonstrate PFC fiber positions through internal capsule, and use this data to show the likely connections captured during DBS in humans.



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Chun Kit Wong:

Research Assistant, CIRC

B. Eng (EE) specialized in RF/Microwave Engineering (NUS)

M. Eng (EE) student, thesis on magnetic resonance (quantitative magnetization transfer)

Interest: MR sequence development, IT hardware/software development

Nanbo Sun:

Nanbo Sun is a PhD student in the Electrical and Computer Engineering Department at the National University of Singapore (NUS), working on machine learning and neuroscience. He received the Bachelor Degree of Engineering from Huazhong University of Science and Technology, China. His major research interest is to find the latent atrophy factors in mental diseases.

Abstract: Recent post-mortem and imaging studies suggest the existence of multiple Alzheimer's disease (AD) subtypes. We employed a data-driven Bayesian model to automatically identify distinct latent factors of overlapping atrophy patterns from voxel-wise structural magnetic resonance imaging (MRI) data of AD dementia patients. Our analyses revealed three atrophy factors: temporal atrophy factor (medial and lateral temporal cortices), subcortical atrophy factor (striatum and cerebellum) and cortical atrophy factor (frontal and parietal cortices) within AD dementia patients. Examination of longitudinal decline revealed that among AD dementia patients, the cortical factor was associated with the fastest cognitive decline compared with other atrophy factors. In contrast, among non-demented participants, the temporal factor was associated with the fastest cognitive decline.

Except the AD, our future study is to develop new models to deal with Autism Spectrum Disorders (ASD) patients who have both atrophy and hypertrophy in the brain.



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Ngo Hoang Gia:

Gia recently graduated from Department of Electrical & Computer Engineering, NUS. Gia's research interests lie in the general areas of machine learning, Bayesian statistics and their application in Computational Neuroscience and Natural Language Processing. His research interests in Computational Neuroscience include devising new parametric mixture models and non-parametric hierarchical Bayesian models to estimate reference atlases of brain networks from large datasets of neuroimages. Before joining CIRC, Gia was doing research on Natural Language Processing, with the focus on transliteration in limited resource scenarios and Bayesian graphical model in language modeling.

--- Admission is free and all are welcome ---