Department of Psychology
The University of Hong Kong
香港大學心理學系

Departmental Seminar

Infant Brain MRI Processing

10:00 a.m. – 11:00 a.m. │ August 23, 2016 (Tuesday)
Rm 813, 8/F, The Jockey Club Tower │ Centennial Campus │ The University of Hong Kong

Prof. Dinggang Shen
Professor of Radiology
BRIC, Computer Science, and Biomedical Engineering
University of North Carolina

Abstract

UNC has been awarded a Baby Connectome Project (BCP) (for which I will serve as Co-PI) for acquiring MR images and behavioral assessments from typically developing children, from birth to five years of age. In this one-hour talk, I will summarize some of the tools that we have developed to the processing and analysis of infant brain MR images, related to BCP. In our study, we are particularly interested in babies from the time of birth to when they are 12 months old. Specially, in this period of time, the human brain undergoes a very significant growth. Understanding this period of the human brain development can tell us a lot about brain disorders that happen in later stages of life. However, due to myelination occurring rapidly in the first year of life, there are dynamic changes in the first year. For example, for the T1-weighted brain MRI, at 2 weeks old, the white matter (WM) is not fully myelinated and its intensity is actually lower than gray matter (GM). At 6 months old, the signal intensity of the WM is almost the same as the GM. After 6 months old, WM-GM contrast becomes similar to adults, with higher intensity for WM and lower intensity for GM. This dynamically changing contrast indicates that the dedicated computational tools are need for processing these images. So, in this talk, I will talk about some infant-centric computational tools that we have developed in our group. I will first talk about how to improve skull stripping for infant data. Then, I will talk about how tissue segmentation can be done for infant data to label the tissues as WM, GM, or CSF. Finally, I will also show some results for diffusion MRI.

About the Speaker

Dinggang Shen is a Professor of Radiology, Biomedical Research Imaging Center (BRIC), Computer Science, and Biomedical Engineering in the University of North Carolina at Chapel Hill (UNC-CH). He is currently directing the Center for Image Analysis and Informatics, the Image Display, Enhancement, and Analysis (IDEA) Lab in the Department of Radiology, and also the medical image analysis core in the BRIC. He was a tenure-track assistant professor in the University of Pennsylvanian (UPenn), and a faculty member in the Johns Hopkins University. Dr. Shen's research interests include medical image analysis, computer vision, and pattern recognition. He has published more than 700 papers in the international journals and conference proceedings. He serves as an editorial board member for six international journals. He has also served in the Board of Directors, The Medical Image Computing and Computer Assisted Intervention (MICCAI) Society, in 2011-2015.

~All are Welcome~

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