The Human Connectome Project: What’s in the Data and How Can I Begin Data Mining?

Organizer:  
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The Human Connectome Project (HCP) recently began a three-year period of systematically acquiring high-resolution MRI scans from a large number of healthy adults, along with extensive behavioral data. This effort, led by Washington University, University of Minnesota, and Oxford University (the ‘WU-Minn HCP Consortium’), follows a two-year period of intensive improvements in data acquisition and analysis that will take advantage of advanced pulse sequences and a customized Siemens 3T Skyra. The MRI modalities include diffusion imaging, resting-state fMRI (R-fMRI) and task fMRI (T-fMRI), along with T1w and T2w structural images. By the time of the OHBM meeting, there will have been two quarterly data releases (winter and spring of 2013), and the data will be available at multiple levels of analysis: (i) primary (unprocessed) datasets from each modality; (ii) minimally preprocessed datasets that have been processed systematically to take advantage of the intrinsically high data quality; and (iii) extensively processed datasets that can be used for visualizing brain connectivity, structure, and function in group averages and in individual subjects.

Learning Objectives: Having completed this workshop, participants will be able to:
1. Acquaint the audience with the exceptionally high quality of the neuroimaging data that have been acquired and made available to the neuroscience community;
2. Illustrate how the data from different imaging modalities have been analyzed and can be visualized; and
3. Provide examples of how the HCP data can be mined in order to relate brain connectivity and function to behavior in individual healthy adults.

Data Acquisition on the WU-Minn 3T Connectome Skyra  
Junqian (Gordon) Xu, Mount Sinai School of Medicine, New York, NY, USA

Analysis and Interpretation of Diffusion Imaging Data Acquired by the WU-Minn HCP Consortium  
Tim Behrens, Oxford University, Oxford, UK

Analysis and Interpretation of Resting-State fMRI and Task-fMRI Data Acquired by the WU-Minn HCP Consortium  
Michael Harms, Washington University, St. Louis, MO, USA

Visualization and Mining of HCP Data in Individuals and Across Groups  
David Van Essen, Washington University, St. Louis, MO, USA