

Brain Image Analysis Seminar

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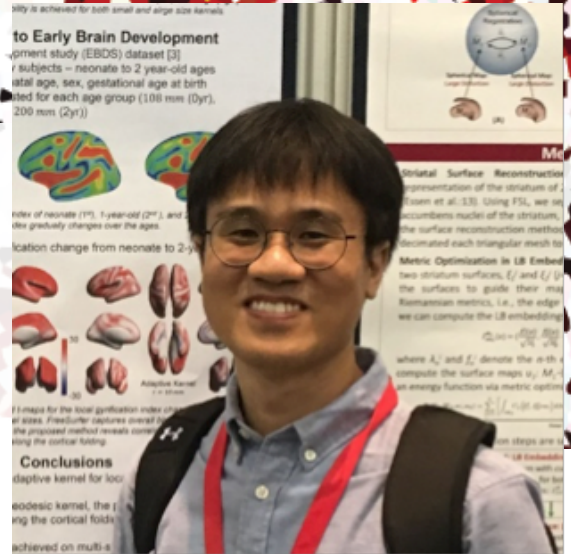
Department of Electrical Engineering and Computer Science

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Surface-based Cortical Morphometry

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Abstract: Cortical morphometric studies have been widely investigated in neuroimaging studies of brain development and atrophy: global or local developmental trajectories over age or anatomical changes, and their relationships with cognitive functions or genetic and environmental factors. However, the main challenge comes from variability in cortical anatomies accompanied with a complicated, dynamic folding process. In this talk, I will review challenges in cortical morphometry and present my recent automated pipeline for cortical shape analysis with its application to neurodevelopmental studies. The pipeline consists of three novel components: (1) sulcal curve extraction and labeling for anatomical landmark detection, (2) cortical surface registration with reduced distortion, and (3) sulcal and gyral region-aware assessment of cortical folding patterns.

Short Bio: Ilwoo Lyu is an assistant professor in the Department of Electrical Engineering and Computer Science at Vanderbilt University. His affiliation is with the Vanderbilt University Institute of Imaging Science (VUIIS) and Vanderbilt Institute for Surgery and Engineering (VISE). He received his Ph.D. in Computer Science from the University of North Carolina at Chapel Hill in 2016, MS and BS in Computer Science from Korea Advanced Institute of Science and Technology (KAIST) in 2011 and 2009, respectively. His research interest is mainly in developing novel algorithms for medical image analysis. In particular, he is working on shape-focused research including surface registration, geometric feature extraction, and 3D visualization. He has published papers in the field of medical image analysis such as MedIA, IEEE TMI, NeuroImage, MICCAI, and IPMI.