Deep Learning for Connectomicss

The importance of research that aims to unlock the mystery of the human brain has recently been recognized worldwide. In January 2013, the European Union selected the Human Brain Project to be one of its two flagship projects. In April 2013, the White House announced the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative to generate a dynamic map of the brain. As these projects move forward, big data analytics will be playing increasingly important roles in converting big brain data into useful knowledge. A key challenge in analyzing brain data is to construct feature representations from brain images. In this talk, I will discuss our efforts in developing deep computational models for learning representations from brain data. In particular, I will provide details on how to use deep learning methods to elucidate the micro-scale brain connectomics among neurons. I will also show that our methods can be used in a number of diverse computational brain discovery tasks. Additionally, they may be used in other areas beyond brain analytics.

BIO:

Shuiwang Ji is currently an Associate Professor in the School of Electrical Engineering and Computer Science, Washington State University, leading the Data Integration, Visualization, and Exploration (DIVE) Lab. Shuiwang Ji received the Ph.D. degree in Computer Science from Arizona State University in 2010. His research interests include machine learning, data mining, computational biology, and brain data analytics. He received the National Science Foundation CAREER Award in 2014. Currently, he serves as an Associate Editor for BMC Bioinformatics and IEEE Transactions on Neural Networks and Learning Systems. He is an elected editorial board member of Data Mining and Knowledge Discovery. He also served as a senior program committee member for the 2015 SIAM International Conference on Data Mining (SDM), and the 2015 International Joint Conference on Artificial Intelligence (IJCAI). He has served as a technical program committee member of major conferences in machine learning (ICML, NIPS), data mining (KDD, SDM, ICDM), and bioinformatics and medical image computing (MICCAI and PSB).