

## Data Science Seminar

Hosted by the Department of Mathematics and Statistics

- Date: Tuesday, March 28, 2023
- Time: 12:00pm - 1:00pm
- Room: Zoom
- Speaker: Dr. Jie Peng (UC Davis)
- Title: Statistical methods for diffusion MRI.

### ***Abstract***

Diffusion MRI is an in vivo and non-invasive imaging technology that uses water diffusion as a proxy to probe architecture of biological tissues. Diffusion MRI technology has been widely used for white matter fiber tracts reconstruction. It also has many clinical applications in neurodegenerative diseases such as Alzheimer's. In this talk, we will discuss various statistical methods for analyzing diffusion MRI data. These methods aim to elucidate voxel-level neuronal fiber organizations based on D-MRI measurements, which are in turn used as inputs in tracking algorithms to reconstruct white matter fiber tracts. We will focus on their capability in resolving crossing fibers and the computational scalability rising from the need to process hundreds of thousands of voxels for each brain image. We will then consider an application of the Human Connectome Project (HCP) where we focus on the reconstruction and lateralization of Superior Longitudinal Fasciculus (SLF), a major association fiber tract that is involved with motor, visual, spatial, memory, and language functions.

Biography of the speaker: Dr. Peng has a PhD in Statistics from Stanford University. She is currently a professor in the Department of Statistics and a member of the genome center, at University of California, Davis. Her research interests include graphical models, statistical genomics, brain imaging data analysis and functional data analysis.

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Last update: **2023/03/12 14:47**

