

Clustering of Sparse High-dimensional Longitudinal Data

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3:30-4:30pm, New PI 6th Floor Multipurpose Room (6602)
Light refreshments provided

Abstract

Longitudinal measurements of ultra-high dimensional brain images are now realities of science. Indeed, there are hundreds of studies collecting multi-sequence multi-modality brain images at multiple time points on hundreds of subjects over many years. A fundamental problem in this context is how to classify subjects according to their baseline and longitudinal changes of their brain images in the presence of strong spatio-temporal biological and technological measurement error. We propose a fast and scalable clustering approach by defining a metric between latent trajectories of brain images. Our method was motivated by and applied to a longitudinal brain morphology study of multiple sclerosis. Results indicate that there are two distinct patterns of ventricular change that are associated with clinical outcomes.

Biographical Note

Seonjoo Lee received her B.S. and M.S. degrees in Statistics from the Seoul National University, South Korea. She completed her Ph.D. in Statistics and Operations Research from the University of North Carolina at Chapel Hill in 2011. Her thesis focused on the development of independent component analysis with biomedical applications. After completion of her degree she joined the Center for Neuroscience and Regenerative Medicine at National Institution of Health and Uniform Service University and is currently working on the development of statistical methodology for high-dimensional longitudinal data. She also interested in multimodal data analysis and latent variable modeling.

¹ The PI Biostatistics Seminar Series is held on Tuesdays at New York State Psychiatric Institute. If you are interested in receiving regular announcements for our seminars in the future, or if you need further information, please contact Jina James (jamesji@nyspi.columbia.edu, (212) 543-5589).