Statistics Department Seminar

Tuesday, April 3rd, 2018 3:45 – 4:45 p.m.
Room 420, Olmsted Hall
Reception in Olmsted 1331 at 3:15

Dynamic Community Detection for Multiple Networks

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Abstract:
Multiple networks are currently becoming more common among network data sets. Usually, a number of network data sets, which share some form of connection between each other are known as multiple or multi-layer networks. We consider the problem of identifying the common and dynamic community structures for multiple networks. We also extend the existing nonparametric latent variable models in the context of multiple networks, and thereby propose a class of network models for multiple networks. We consider extensions of the spectral clustering methods for the multiple network models, and give theoretical guarantee that the spectral clustering methods produce consistent community detection in case of both multiple stochastic block model and multiple degree-corrected block models. The methods are shown to work under sufficiently mild conditions on the number of multiple networks to detect associative, dissociative and mixed community structures, even if all the individual networks are very sparse and most of the individual networks are below community detectability threshold. We reinforce the validity of the theoretical results via simulations too.

Biography:
Dr. Sharmodeep Bhattacharyya is an Assistant Professor in Department of Statistics, Oregon State University. He received his PhD in Statistics from University of California, Berkeley in 2013 under supervision of Prof. Peter J. Bickel. Before joining Oregon State University in Spring 2015, he was also a post-doctoral research scholar in Department of Statistics, UC Berkeley. His research interests lie in several fields of statistics including statistical inference of networks, high-dimensional statistical inference, clustering, semiparametric inference and hypothesis testing. He is also interested in the application of statistical methods in neuroscience, genomics and astronomy and collaborates with Life Sciences Division, Lawrence Berkeley National Laboratory.