

**Indiana University-Purdue University
Indianapolis**
Department of Mathematical Sciences

STATISTICS SEMINAR

12:15pm—1:15pm, Tuesday, April 06, 2021

Zoom Meeting: Meeting ID: 751 025 519

Speaker: **Abhishek Kaul**

Department of Mathematics and Statistics at Washington State University

Title: **Inference on the Change Point for High Dimensional
Dynamic Graphical Models**

Abstract:

We develop an estimator for the change point parameter for a dynamically evolving graphical model, and also obtain its asymptotic distribution under high dimensional scaling. To procure the latter result, we establish that the proposed estimator exhibits an $Op(2)$ rate of convergence, wherein ρ represents the jump size between the graphical model parameters before and after the change point. Further, it retains sufficient adaptivity against plug-in estimates of the graphical model parameters. We characterize the forms of the asymptotic distribution under the both a vanishing and a non-vanishing regime of the magnitude of the jump size. Specifically, in the former case it corresponds to the argmax of a negative drift asymmetric two sided Brownian motion, while in the latter case to the argmax of a negative drift asymmetric two sided random walk, whose increments depend on the distribution of the graphical model. Easy to implement algorithms are provided for estimating the change point and their performance assessed on synthetic data. The proposed methodology is further illustrated on RNA-sequenced microbiome data and their changes between young and older individuals. (<https://arxiv.org/abs/2005.09711>)

Bio:

Dr. Abhishek Kaul is an assistant professor at the Department of Mathematics and Statistics at Washington State University. He received a Ph.D. in Statistics (2015) from the Department of Statistics and Probability at Michigan State University. His research interests focus on the development and analysis of statistical methods for high dimensional data under non standard formulations, such as high dimensional dynamic models characterized via change points, error-in-variables models, missing data structures. He is also interested in machine learning applications such as unsupervised classification of imaging data.