

The College of Arts & Sciences  
Department of Mathematical Sciences

Colloquium

# Professor Jiyeon Song

University of Michigan

Thursday, October 6<sup>th</sup>  
Room 4221, French Hall West  
4:00 – 5:00 pm

## *Bayesian Inference for High Dimensional Cox Models Using the Gaussian and Diffused-gamma Prior*

High-dimensional inference in a survival setting is challenging theoretically and computationally. Bayesian approaches have emerged as useful alternatives for high-dimensional inference, performing variable selection and statistical inference simultaneously, but high computational costs have prevented their widespread use. The Gaussian and diffused-gamma (GD) prior, a new Bayesian shrinkage prior that leads to a continuous-and-differentiable L<sub>0</sub>-norm approximation, has demonstrated computational efficiency in selection and inference. As the GD prior was designed for generalized linear models, its utility in semi-parametric survival settings is unknown. We propose a rank-based Bayesian inference procedure with the GD prior in conjunction with the Cox partial likelihood. For posterior inference, we develop a computationally efficient procedure via the iterative conditional mode (ICM) algorithm and Markov chain Monte Carlo methods. Simulations provide evidence of the utility and usefulness of our method. The proposed methodology is applied to an EHR dataset to assess risk factors associated with mortality of COVID-19 patients admitted to the Intensive Care Unit (ICU) in a regional center managing the urgent care of COVID-19 patients.

Refreshments will be served 3:15 – 3:45 pm in the Faculty Lounge  
4118 French Hall West

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