Department of Mathematics and Statistics Colloquium

Statistics in Space, Time, and Society: Three Problems with Spatio-Temporal Models with Strong Policy Applications

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Abstract: Spatio-temporal models have been studied in different flavors for quite some time in the statistics literature. In this talk, I will introduce three different research problems that I am working on which all have two things in common: a spatio-temporal modeling aspect and a direct application to policy outcomes. The first problem uses network analysis to study the linkages between global finance and trade. I introduce some of the techniques that we have developed to study the spatio-temporal patterns in the global financial breakdown and subsequent trade-related issues. The second problem looks at how exposure to extreme heat can affect pregnancy outcomes and introduces a basic model to capture the effect of extreme heat on pregnancy outcomes. The third problem looks at how information (including, if you will, fake news) diffuses in space and time online, and how this affects political polarization among people. This last is work just started but I will introduce the basic modeling concepts and how policy interventions may be designed based on this model. In terms of methods, the three problems use different ideas and concepts from modeling and statistics: network analysis and sparse vector auto-regression, hierarchical modeling, and topic modeling. But they all share the basic thematic idea that statistics over space and time can result in interesting models (good for methodologists!) and these are becoming more and more relevant to society (good for practitioners!).

Monday, February 26 at 3:50 in Roop 103

Refreshments at 3:30