

IGERT Research rotation proposal

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Host : Dr. Bruce Desmarais

Project title: Modeling interference in networks, based on field experiments

Project proposal

Networks are integral parts of human interaction and hence social science research. If one unit in a network gets treated, the effect may trickle throughout the network. The currently established framework for causal inference relies on SUTVA (Stable Unit Treatment Value Assumption). It assumes that whether or not one person/unit/node is treated, does not affect any other unit. However, SUTVA breaks down in a network setting. In field experiments on social groups, interference may be substantial.

It is, therefore, important to take the interference structure into account. Rather, in some cases, substantive interest may be in studying the propagation of treatment effect itself. For example, in designing a public health policy where we wish to maximize the impact with constraints on budget. Or to understand the effectiveness of a marketing campaign.

In this project we intend to study interference models for randomized experiments conducted on social networks and causal inference basis this. We plan to re-analyze data from past field experimental studies to understand how conclusions regarding direct effects and

interference effects depend upon the structure of network.

Big Data & Computation: Social network data are inherently large since the volume of data is on the order of the number of vertices squared. Second, the randomization/simulation based tests we're considering are computationally intensive. Finally, one of the most pertinent potential application domains of the experimental methods we are considering involve advertising in online social networks.

Meetings : Weekly meeting with Dr. Bruce Desmarais on Tuesdays from 10-10.30 am.

Publication strategy: By the end of Spring 2016, we intend to prepare manuscript for a paper that can be published in a political science or statistics journal.