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Title: Valid inference from non-ignorable network sampling designs and the estimation of causal peer-influence effects on social media platforms

Abstract: A number of scientific endeavors of current national and international interest involve populations with interacting and/or interfering units. In these problems, a collection of partial measurements about patterns of interaction and interference (e.g., social structure and familial relations) is available, in addition to the more traditional measurements about unit-level outcomes and covariates. Formal statistical models for the analysis of this type of data have emerged as a major topic of interest in diverse areas of study. In this talk, I will review a few ideas and open areas of research that are central to this burgeoning literature, placing emphasis on inference and other core statistical issues. Then I will turn to describe a new notion of non ignorability that applies to network sampling designs, an inference strategy that can be used to obtain valid estimates in these settings, and a randomization-based approach to estimating the causal effect of peer-influence effects, with hints to the applications in marketing on social media platforms and healthcare in which these statistical problems arise.

Bio: Edoardo M. Airoldi is an Assistant Professor of Statistics at Harvard University, founder and director of the Harvard Laboratory for Applied Statistical Methodology (aka, the Lab), and a Principal Investigator at the Broad Institute of MIT & Harvard. Before joining Harvard, he was a postdoctoral fellow at Princeton University in the Department of Computer Science and the Lewis-Sigler Institute for Integrative Genomics. He received his B.Sc. in Mathematical Statistics from Bocconi University and his Ph.D. in Computer Science from Carnegie Mellon University. His research interests include statistical methodology and theory, statistical foundations of network data analysis, and machine learning methodology, with application to molecular and systems biology, the analysis of large biological and information networks, and marketing on social media platforms. He is the recipient of an NSF CAREER Award (2012), an Alfred P. Sloan Research Fellowship (2012), a Big Think Delphi Fellowship (2011), and his work has received several outstanding paper awards, including the John Van Ryzin award (2006) from the International Biometrics Society. He currently advises several startups and nonprofit think-tanks on statistical issues related to estimating and leveraging peer-influence and peer-pressure on Facebook.