REVEALED PREFERENCE MODELS FOR NETWORK INFERENCE

Ryan Admiraal[1], *Mark S. Handcock*[2]

[1] *Murdoch University, 90 South Street, Murdoch, WA, 6009, Australia*
R.Admiraal@murdoch.edu.au

[2] *University of California at Los Angeles, Los Angeles, CA, 90095, USA*
handcock@ucla.edu

Networks have commonly been used to represent relational data, but, historically, most research has focused on descriptive measures of networks and not network inference. Only recently, the development of exponential random graph models (ERGMs), or p* models, has led to a viable class of stochastic models for network inference. These models, first proposed as the dyad independence p1 model by Holland Leinhardt (1981) before being extended to allow for dyad dependence, provide a unified framework for not only network inference but also network simulation.

We describe a new class of models being developed for network inference. This class of models, which we call revealed preference models (RPMs), has its origins in the economic theory of stability of two-sided markets, which attempts to describe the set of conditions under which a proposed matching consisting of pairs of agents on opposite sides of a market (e.g., universities and students) will be adhered to by all possible coalitions of agents (Roth and Sotomayor, 1990). RPMs were developed by Logan, Hoff, and Newton (2008) for one-to-one matchings and work under the assumption that an observed matching is stable. This matching can then be used to estimate agents' preferences for certain characteristics. For instance, Logan et al. use data for single individuals and married couples to estimate male and female preferences for partners of various age, education, and religion categories. We extend this work to allow for many-to-one and many-to-many matchings, specifically considering this in the context of heterosexual partnership networks where individuals may have multiple partners at a given time.

References

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Ryan Admiraal *currently works as a lecturer at Murdoch University, Perth. His primary area of research interest is social network analysis, speci_cally the use of exponential family random graph models, revealed preference models, and sequential importance sampling in inference for heterosexual partnership networks.*