

COLLOQUIUM SERIES: FALL 2015

LATENT SPACE MODELS FOR DYNAMIC NETWORKS

Abstract:

Dynamic networks are used in a variety of fields to represent the structure and evolution of the relationships between entities. We present a model which embeds longitudinal network data as trajectories in a latent Euclidean space. A Markov chain Monte Carlo algorithm is proposed to estimate the model parameters and latent positions of the actors in the network. The model yields meaningful visualization of dynamic networks, giving the researcher insight into the evolution and the structure, both local and global, of the network. The model handles directed or undirected edges, easily handles missing edges, and lends itself well to predicting future edges. Further, a novel approach is given to detect and visualize an attracting influence between actors using only the edge information. We use the case-control likelihood approximation to speed up the estimation algorithm, modifying it slightly to account for missing data. We apply the latent space model to data collected from a Dutch classroom, and a cosponsorship network collected on members of the U.S. House of Representatives, illustrating the usefulness of the model by making insights into the networks.

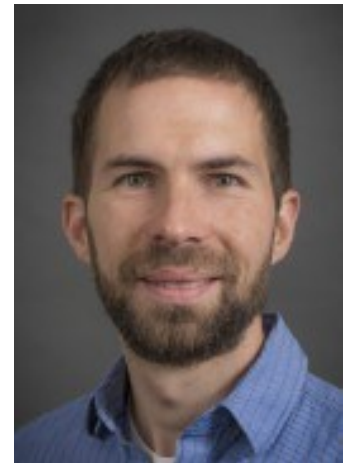
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PROFESSIONAL INTERESTS:

**NETWORK ANALYSIS
CLUSTERING
BAYESIAN METHODOLOGY
STATISTICAL COMPUTING**

WHEN

**September 24, 2015
3:30 p.m.**

WHERE

61 Schaeffer Hall

RECEPTION

**241 Schaeffer Hall
3:00 p.m.**

