Contribution ID : **149** Type : **Oral presentation**

A logistic actor-attribute latent space model for social influence

A central task in network analysis is to model social influence, that is, how the social environment shapes individual behaviors and outcomes. Autologistic actor attribute models (ALAAMs) provide a relevant framework for this purpose, using an exponential-family formulation to model binary actor-level outcomes given an observed network. However, ALAAMs treat the network as a fixed, deterministic object, without modelling its structure. Latent position models, by contrast, represent network data in a low-dimensional latent space, where actors positioned closer together are more likely to share a social tie. These models are flexible and can incorporate dyadic covariates, node attributes, and other structural effects.

In this work, we propose a novel approach that bridges these two modelling frameworks by jointly modelling the outcome as a function of network structure, represented through a latent social space. Specifically, we introduce the logistic actor-attribute latent space model for social influence. Our goal is to model the probability of a binary actor-level outcome as a function of both observed covariates and latent positions. The latent space serves as an interpretable, low-dimensional representation of the underlying social structure. Conditional on these latent positions, outcomes are assumed to be independent, with the latent space capturing complex dependencies not explained by covariates alone. The model is formulated within a Bayesian framework, with inference performed via a Gibbs sampling algorithm, enabling efficient posterior estimation and principled uncertainty quantification.

Keywords/Topics

social influence actor attribute model latent space model bayesian inference

Primary author(s) : Dr. CORSINI, Noemi (University of Cambridge); Dr. FOP, Michael (University College Dublin)

Presenter(s) : Dr. CORSINI, Noemi (University of Cambridge)

Session Classification : YoungARS

Track Classification : YoungARS