Assignments $\mathcal{N}^{\underline{o}}$ 9

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Task 1: SAOMs Assumption   10 points

During the lecture we discussed the plausibility of some assumptions of the SAOMS (e.g. assuming that creating a tie is the opposite of terminating a tie).

(1.1) Let us now consider all the assumptions of SAOMs. Give at least two examples where some of these assumptions might be implausible.

(1.2) Let us consider the data requirements to estimate the model. What is a good schedule (time elapsed between two observations) to collect your data and to avoid troubles in justifying the plausibility of some assumptions and reaching the convergence of the Robbins-Monro algorithm?
(Keep in mind that each survey is costly...)

Task 2: Creating and terminating ties – R task   10 points

Let us consider the data collected by Andrea Knecht.

(a) Estimate a SAOM specified by

   - outdegree and reciprocity for the evaluation function
   - reciprocity for the endowment function

Compute the gain/loss in the utility function when

   - a tie not reciprocating an existing tie is created

- a tie reciprocating an existing tie is created

- a tie reciprocating an existing tie is dissolved

and comment on the results.

(b) Add the transitive triplets and the 3-cycles effects to the evaluation function. Add one or more effects in order to test the hypothesis that terminating a tie closing a transitive triad is not attractive for an actor and estimate the model. What do you observe? Is the hypothesis supported by the data?

(c) Add one or more effects to test if homophily with respect to gender and similarity with respect to delinquency favour either the creation or the maintenance of friendship ties. Compare your results with those deriving from the estimation of the STERGMs (last slide on Temporal Exponential Random Graph Models) and motivate possible differences.