

Game Theory for Network Evolution

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Social Network Dynamics

[Wang, Luo, Gao, SODA'22]

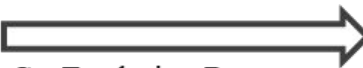
- Social Influence: one's opinion is influenced by neighbors' opinions.
- **Tie dynamics**: tie strength altered by agreement/disagreement.

Edges: social ties

Liberal

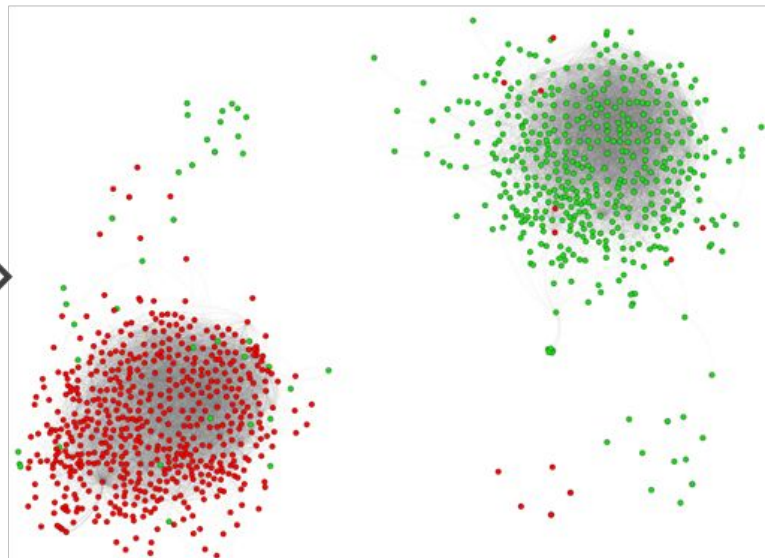
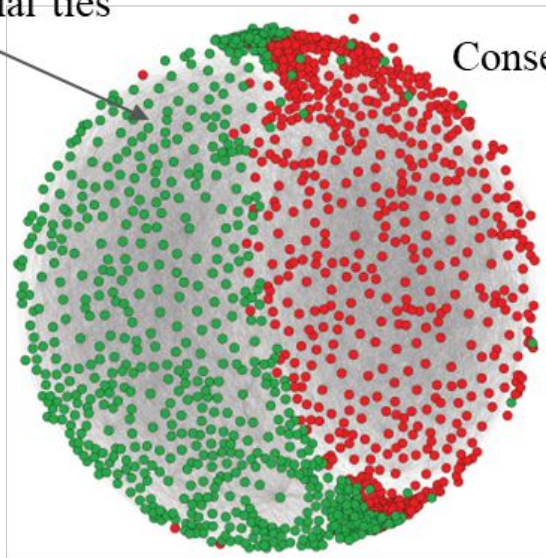
Conservative

With info of 20% nodes



Co-Evolution Process

Remove negative ties



Problem: Social Learning on a Network

- Agents on a network repeatedly take noisy observations of an unknown ground truth
- Agents **run a game** with neighbors
- Q: What game?
- Q: How to ensure successful (asymptotic) learning?

Problem: Network Formation Game

- What drives network evolution?
- Social network
- Internet
- Road network
- Flight network