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Review Article Overview
CS 790R – 3/29/06

Gonzales, Lind & Herrmann (2006) - System of Mobile Agents to Model Social Networks

- Creation of a network with small-world properties (small average path length with high clustering coefficient) through physical interaction
- Agents move about with velocity based on the initial velocity plus a constant multiplied by the degree, meaning those agents with more connections move faster
- Preferential attachment achieved not by assigning probability of connection based on degree (as in scale-free designs) but by increase of velocity based on degree
- Agents enter with a random age and will die when the maximum age is reached, with all connections removed
- Combining this maximum age and the characteristic time between collisions (based on physical parameters of agent size, density of agents and initial velocity) provides a metric for examining the average degree achieved in the life of an average agent
- Empirical studies of friendship networks within schools used for comparison with the model. Comparison showed good agreement between the model and empirical results
- Model was able to simulate the formation of cliques as seen in the empirical studies
- Introducing a randomly assigned variable related to promiscuity to the model generates degree distributions similar to those found empirically for sexual contacts.

- One concern from the discussion was what the variables they use to tweak might correspond to in the real world. Also they don't really cover how they explored parameter space to get these optimum values or what other types of behaviors they may get from other areas in that parameter space.
- It is also unclear from an abstract point of view as to what exactly their physical two-dimensional space translates to in the real world.
- There was also a question as to what the average distance traveled was during a lifetime, or how many collisions were with agents they were already connected to, in what ratio to new unknown agents.
- Finally the model does not take into consideration the property of the empirical models of births and deaths (so to speak) happening in chunks. Also the lifetime tends to be constant for schools as well.