

Computer Science Department
COLLOQUIUM

Wed., November 6, 2013

in 006 Steele at 4:30pm

GWEN SPENCER



**Influence Beyond Exposure: Tackling
an Economic Variant of Seeding Viral Spread**

The problem of seeding "contagion" in social networks has attracted substantial attention for its connection to viral marketing. Simple information-spread models yield nice mathematical properties that allow theoretical algorithmic traction. This work often points to some form of "exposure" as the best paradigm for designing seed sets. While exposure-based seeding may spread awareness effectively, being aware of a behavior often doesn't result in a decision to adopt it. When environmental economists describe decisions to engage in green behaviors, when sociologists model norm-spread, and when game theorists consider choices to adopt cooperative strategies in repeated-game-play, a common more-complex spread mechanism emerges. What can we learn about how to virally market biking to work, adopting health-related behaviors, and cooperating at an equilibrium that is mutually beneficial? Dr. Spencer will mention convergence results for this spread mechanism, (daunting) hardness results for the seeding question, and (heartening) computational results from heuristics derived by truncating an exact (inefficient) Integer Program. Compared to exposure-based seeding, the advantage of a seeding paradigm that establishes "critical mass locally" appears largest when the network is highly clustered (as social networks often are).

Dr. Gwen Spencer is a Neukom Postdoctoral Fellow, joint in Computer Science and Environmental Studies. Her PhD focused on approximation algorithms for stochastic graph-fragmenting problems motivated by planning spatial placement of controlled burns to limit wildfire damage (at Cornell, with David Shmoys). Gwen is generally interested in optimization problems in networks which consider probabilistic inputs, probabilistic effects of actions, and incentives.

Tea @ 3:45 pm outside 006 Steele