Information Science & Technology Student/Postdoc Seminar

Laura Smith
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"Modeling Street Gang Rivalries in Los Angeles"

Tuesday, December 20, 2011
9:30 - 10:30 AM
TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: We propose two models to simulate the creation of street gang rivalries and their territories. The first approach uses an agent-based model. Here, the movement dynamics of agents are coupled to an evolving network of gang rivalries, which is determined by previous interactions among agents in the system. The second approach modifies a partial differential equation model for coyotes and wolves. Territorial animals and street gangs often exhibit similar behavioral characteristics. Both groups have a home base and mark their territories to distinguish claimed regions. Both models integrate basic gang data, geographic information, and behavioral dynamics suggested by the criminology literature. The major highways, rivers, and the locations of gangs' centers of activity influence the agents' motion. We use a policing division of the Los Angeles Police Department as a case study to test our model. We apply common metrics from graph theory to analyze our model, comparing networks produced by our simulations and an instance of a Geographical Threshold Graph to the existing network from the criminology literature.

Biography: Laura Smith received her B.S. and M.S. in Mathematics from Western Washington University. She is expecting her PhD in Applied Mathematics June 2012 from the University of California, Los Angeles. Laura's research interests include Image processing, data fusion, density estimation, variational methods, partial differential equations, crime modeling, agent-based models complex networks, and dynamical systems.

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