



UCSB Department of Geography  
Geography of the Information Society  
**COLLOQUIUM**

**Date:** Thursday, March 3, 2011

**Time:** 3:30-4:30 PM

**Place:** Buchanan 1940

**Speaker:** PAUL M. TORRENS

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PhD: Geography, University of London, 2004

**Title:** Animating Behavioral Geography in Computer Simulations

**Abstract:**

Behavioral geography is a broad field, but at its essence it is concerned with the acquisition of geographical information through spatial cognition, thinking, and ability and with people's use of that information in structuring their actions, interactions, and activities in space and time. The geography of these behaviors is important across a range of domains, from social science and the provision of location-based informatics to behavioral health and emergency response. Recently, *agent-based models* have become a popular tool for simulating behavioral geography in computer simulation, because of their native ability to handle spatiotemporal dynamics in complex systems scaling from individual people to the aggregate phenomena that they produce. The geographical fidelity of these models is naturally most acute when they reproduce the geography of agent behaviors appropriately: by placing people in the right places, at the right times, doing the right things, in the right contexts. However, most agent-based models rely on simple, abstract physical heuristics to drive the geography of synthetic characters. While these may be analytically tractable in simulation, they often bear little resemblance to real-world behaviors. In this talk, I will introduce an alternative scheme that allows for much more detailed, dynamic, and realistic models of agent behavior to be modeled and explored in simulation, ultimately expanding the range of questions that can be posed in simulation. The approach enables a convergence of behaviorally-driven agent-based simulation with Geographic Information Systems and technologies developed for computer gaming and digital special effects. I will also describe how this scheme can be coupled to data-driven models of people's actual behavior in real-world environments and contexts, using machine-learning and knowledge discovery. I will demonstrate the usefulness of the approach with reference to application scenarios for quotidian and extraordinary behavioral geography in urban settings, including walking, evacuation dynamics, rioting, and disasters.

**Brief Bio:**

Dr. Paul M. Torrens is an Associate Professor in the School of Geographical Sciences & Urban Planning at Arizona State University and Director of its Geosimulation Research Laboratory. Paul is also an Affiliate in the University's Center for Social Dynamics and Complexity and the GeoDa Center for Geospatial Analysis and Computation. His work is focused on Geographic Information Science and development of geosimulation and geocomputation tools, behavioral geography, urban geography, and the study of emerging cyberspaces. His research earned him a Faculty Early Career Development Award from the U.S. National Science Foundation in 2007 and he was awarded the Presidential Early Career Award for Scientists and Engineers by President George W. Bush in 2008 for his work on computer models of human behavior in critical situations. The Presidential Early Career Award is the highest honor that the U.S. government bestows upon young scientists; this was the first PECASE for geography.

For more information: <http://www.geosimulation.org/>.