

fall 2005 ETCS Colloquium Series

Monday, October 31, 2005
12:00 – 1:15 PM
KT 146

ALL FACULTY, STAFF, STUDENTS AND COMMUNITY INDIVIDUALS ARE INVITED.

A High-fidelity Agent-based Model for Studying Interactions between Nomad and Peasant Populations

By



ASSOCIATE PROFESSOR ROBERT SEDLMEYER

Abstract: Agent-based Models (ABMs) provide a means for modeling conflicting forces in scenarios that capture more real-life complexity than possible through verbally stated theories or simplified mathematical models. ABM simulations allow researchers to program theoretical processes, and test whether or not these processes lead to observed phenomena in the context of simulated social systems. Using the Swarm framework, we have developed a simulation platform, called NOMAD, to model the dynamic trading and raiding interactions between animal herding pastoralists and their agrarian peasant partners. We have extensively researched ethnographic and other data sources to incorporate as much realism as is possible. Our primary aim is the testing of anthropological and historical theories of pastoralism. We have applied our high-fidelity model to two scenarios: (1) a generalized Middle Eastern setting; and (2) the volatile region of Darfur, Sudan. In developing these models, we have paid close attention to environmental features, the ecological relationships between population growth and land use, and demography. We added special consideration of how terms of trade would evolve between nomad and peasant agents, and how such terms can tip relations from peaceful trading to violent raiding. In this presentation we describe the architecture of our model, the results of applying it to these two scenarios, on-going work in model refinement, and the prospects for creating a reusable agent library for studying these interactions in a wide variety of settings, both geographic and historical. NOMAD is a collaborative effort between Dr. Lawrence Kuznar (Anthropology), Dr. William Frederick (Mathematical Sciences) and Prof. Bob Sedlmeyer (Computer Science). Computer Science graduate students Alyson Kreft and John Bryan have made important contributions to the Swarm, and currently, RePast, implementations of NOMAD.

Biography: Professor Sedlmeyer received his B.S. (1976) and M.S. (1977) degrees from Purdue University. He has been a member of the IPFW Department of Computer Science since 1977, and has consulted for Raytheon, ITT, Lincoln National, Ph. D. Corporation, and Logikos. His research interests include agent-based modeling, genetic algorithms, and automated tools for software testing and debugging. He is also co-principal in an entrepreneurial venture developing educational software for the health sciences.

Pizza and drinks will be furnished, compliments of Dean Voland.

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