EPP and Center for Climate and Energy Decision Making

Sponsored Seminar

Robert Axtell

Chair and Professor

Department of Computational Social Science

Krasnow Institute for Advanced Study

George Mason University

Presenting on:

"Pathologies of Integrated Assessments of Climate Change and What Can Be Done to Fix Them"

March 30th, 2015

12:00 noon

(Lunch will be served)

Baker Hall 129 Conference Room

Department of Engineering and Public Policy

Seminar Abstract:

For nearly a generation the construction of integrated assessment models (IAMs) for global-scale problems has been an important activity of researchers concerned with evaluating the costs and benefits of human-induced global change, in order to find strategies for mitigating the effects of such change on human populations. To date a wide variety of such models have appeared, from simple linear, equilibrium ones to complex, nonlinear, dynamical models that must be solved computationally. In this talk I will survey this stream of research, focusing on the common features of such models, highlighting both the strengths and weaknesses of the overall approach. I will argue that extant IAMs suffer from a variety of problems representing social behavior that are common in other branches of the social sciences (e.g., macroeconomics) having to do with the use of representative actors/neglect of real-world heterogeneity, simplistic representation of human behavior, assumptions of technological stationarity in a non-stationary world, disregard of agent learning and the evolution of beliefs, and limited focus on governance issues. All told, these *positive* foibles make conventional IAMs ill-suited for policy and related *normative* uses. I argue that a new class of IAMs is necessary in order to avoid these problems. A new IAM architecture is proposed in which low level social and physical processes, grounded in the activities of individual humans, are fully-represented using purposive software objects or *agents*. With modern computing technologies it is today possible to realize such models at the level of 10^9 interacting agents, i.e., at full-scale with the human activities that are responsible for the emergence of the *anthropocene*. I call for a research program dedicated to the challenges associated with global-scale models of humanity, and believe that only through such research can assessments that are truly integrated be realized.

Speaker Bio:

Rob Axtell is Professor and Chair of the Department of Computational Social Science at George Mason University, the first degree-granting department of its kind in the world, part of the Krasnow Institute for Advanced Study. He is Co-Director of the new Computational Public Policy Lab at Mason and External Faculty Member at both Northwestern University's Institute on Complex Systems and the University of Waterloo's Institute for Complexity and Innovation. Previously he was a Senior Fellow in the Economic Studies and Governance Studies programs at the Brookings Institution. He has been Visiting Professor in the Complexity Economics Programme at the University of Oxford, Mellon Visiting Distinguished Professor at Middlebury College, and External Professor at the Santa Fe Institute.