"Computational Exploration in Long Term Policy Analysis for Complex Social and Organizational Systems"

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Friday, Apr 07. 1pm to 3pm.
UCLA Powell Library, Room 285.
Human Sciences and Complexity Video Conference.

The world faces profound social, economic, environmental, and technological transitions. How we choose to meet our challenges – stemming global terror, halting the spread of AIDS and other infectious diseases, designing a global trading system, achieving sustainable development, managing new genetic technologies, etc. -- will resonate throughout the 21st century. So, it is important to think about the long term. But even when we value the long-term, it can be hard to translate concerns into action. The inability to devise objective, actionable plans for the long term often leaves goals relating to the future unvoiced because they cannot be connected to credible near-term actions.

This talk will describe new methods enabled by the capabilities of modern computers that can dramatically improve our ability to reason about the long-term future. These methods harness computation not to solve the intractable problem of predicting the long-term future, but instead to enable a fundamentally different, more sensible question: Given what we know today, how should we act to best shape the long-term future to our liking? We can use computers to create and consider myriad plausible futures, likely to include at least one similar to what may actually unfold. We can then discover near-term actions that perform well, compared to the alternatives, over all these futures, often through clever hedging actions and adaptation to updated information. Finally, the computer can be set to seek plausible futures that "break" a chosen strategy. After repeated iterations to shore up revealed weaknesses, the resulting strategy can support a consensus for successful action. In the end, the process yields near-term strategies not merely optimized for some "best guess" scenario but rather robust across a multitude of scenarios.

The result is a powerful enhancement to the human capacity to reason in the face of enormous uncertainty. This approach combines some of the best features of the qualitative scenario-building and quantitative decision-making tools developed and applied for more than five decades. These new tools may help address a paradox of decision-making: our greatest potential influence for shaping the future may often be precisely over those time scales where our gaze is most dim. Further, they provide an avenue for escaping the fruitless arguments that routinely arise among stakeholders over which future is the one for which we must prepare.

References

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Steve Bankes is Chief Technology Officer for Evolving Logic Inc., a software firm developing decision support systems for complex and deeply uncertain problems. He is also Professor of Information Science at the RAND Graduate School, where he teaches courses in Agent Based Modeling and Artificial Societies, and Policy Analysis for Complex Systems. Dr. Bankes is the originator of the computational research methodology known as “exploratory modeling”, which provide a basis for studying complex, adaptive, and incompletely understood systems through computational experiments. And he is the main designer of the Computer Assisted Reasoning system (CARs), a technology that facilitates robust decision support for many important problems in government and industry. Dr. Bankes has over 50 publications in a variety of areas including computer science, operations research, global climate policy, sustainable development, computational social science, and neurophysiology. He received his B.S in Engineering from Caltech, and a Ph.D. in Computer Science from the University of Colorado. He holds two patents for software technology with two others pending. He is a recipient of the Barchi Prize, awarded by the Military Operations Research Society. He serves on the board of directors for the Center for Computational Social Science and the Center for Governance, and is a member of the Center for the Study of the Evolution and the Origin of Life, and a member of the External Advisory Committee of the Human Complex Systems Program, all at UCLA. His current research interests include computational science, modeling and simulation theory and practice, complex adaptive systems, machine learning and self-organizing systems, and agent based simulation of social systems. www.evolvinglogic.com