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GLOBALIZED DECISION INFORMATICS

Simfrastructure, a pervasive access-oriented synthetic information platform is under development and is intended to be scalable to become a flexible global decision informatics resource. This talk will overview the decision informatics research program, from theoretical foundations to demonstrations of applied use. There is increasing appreciation of scientific content in and, perhaps more importantly a practical need for, understanding complex, networked systems. Socially coupled economic, technological and biological systems are particularly important and central general cases. Management of political and social policy making, markets, infrastructures, contagious and non-contagious diseases are examples of policy and governance domains of those kinds. Infrastructure planning, natural disasters, political instability, terrorism, environmental and resource evaluation, pandemics, etc., all pose highly interdependent and vexing problems to governance. A common approach to support policy and decision making revolves around study of complex (systems-of-) systems modeling. Analysis based on these models is usually provided by experts, often researchers, to decision makers in governing organizations. A newer direction for access to socially-coupled systems information is the broad class of web- enabled population participation methods. Our approach- based on pervasive access to high performance computing, creation and distribution of contextually prescribed detailed synthetic information resources for socially coupled systems, and involvement of interdependent stakeholders- includes both of these general approaches.

BIOGRAPHY

Christopher Barrett is Director of the Advanced Computing and Decision Informatics Laboratories (ACDIL) at Virginia Bioinformatics Institute (VBI) and a Professor in the Department of Computer Science at Virginia Tech. Specializing in decision informatics and large-scale modeling, this laboratory conducts broadly applicable research on interdependent biological, information, social and technology systems, designing and analyzing simulations of extremely large systems and implementing them on high-performance computer systems. Foundational research in mathematics, theoretical computer science and network science related to complex systems underwrites the laboratory's programs. Diverse active research areas for the ACDIL include

epidemiology and the spread of infectious diseases, social networks, settlement infrastructures and related social and population dynamics, integrated next-generation telecommunications systems and economic analysis in the financial and commodity markets. This simulation modeling, for example, can play a key role in shaping public health policies and mitigating the potential impact of a disease outbreak. By incorporating transportation data into the system, the ability exists to develop real-time modeling of public health epidemic data on large-scale city health systems holding the potential to mitigate the impact of a disease outbreak. Representation of intelligence and agency in these large systems, including the cognitive, social cognition and social assets, are central features of Professor Barrett's interests.

In 2004, Barrett retired from Los Alamos National Laboratory, where he was the leader of the Basic and Applied Simulation Science Group and had built a research program active in theoretical and applied research in intelligent systems, distributed systems and advanced HPC-based computer simulation, and then, came to VBI to set up the Network Dynamics and Simulation Science Laboratory, which has grown into the ACDIL.

Professor Barrett received his Ph.D. in bioinformation systems from the California Institute of Technology and has been widely recognized for his work.