**Title**

**“Markov Brains—Evolved Networks of Logic Gates”**

**Abstract**

After a brief introduction to the mission and nature of the BEACON Center, Goodman will present several examples of research in evolutionary computation going on in BEACON. He will list some BEACON collaborations with Chinese researchers, then describe in more detail four recent projects: (1) a representation and operators for problems with repeated subunits, (2) a new parameterless blackbox optimizer for combinatorial problems, (3) a land-use optimization problem with collaborators in Switzerland, and (4) the Markov Brain approach applied to evolution of swarming behavior and to maze running.

**Brief Bio**

**Erik D. Goodman** is PI and Director of the BEACON Center for the Study of Evolution in Action, an NSF Science and Technology Center headquartered at Michigan State University, funded at $47.5 million for 2010-20, with a diverse research program and extensive education and outreach programs. BEACON now has a very diverse membership of over 600, including evolutionary biologists and computer scientists/engineers studying evolutionary computation or digital evolution. Goodman received the Ph.D., computer and communication sciences, University of Michigan, 1972. He joined MSU’s faculty in Electrical Engineering and Systems Science in 1971, was promoted to full professor in 1984, and also holds appointments in Mechanical Engineering and in Computer Science and Engineering, in which he has guided many Ph.D. students. He directed the Case Center for Computer-Aided Engineering and Manufacturing from 1983-2002, and founded and directed MSU’s Manufacturing Research Consortium from 1993-2003. He co-founded MSU’s Genetic Algorithms Research and Applications Group (GARAGe) in 1993, conducting many projects under industrial sponsorship. In 1999, he co-founded Red Cedar Technology, Inc., (now a subsidiary of Siemens AG) which develops design optimization software, and was Vice President for Technology until BEACON was founded in 2010. He was chosen Michigan Distinguished Professor of the Year, 2009, by the Presidents Council, State Universities of Michigan. He was given MSU’s Distinguished Faculty Award in 2011. He was Chair of the Executive Board and a Senior Fellow of the International Society for Genetic and Evolutionary Computation, 2003-2005, and was the founding chair of ACM’s SIG on Genetic and Evolutionary Computation (SIGEVO) in 2005. He also co-leads an information and communication technology for development project in Tanzania and is involved in an ag technology improvement project in Kenya.