Keith Rehermann
"Modeling Biological Networks with Swarm"
University of Notre Dame
Poster Session

ABSTRACT

Recent developments in network theory have sparked interest from numerous fields, ranging from sociology to biology and economics. There is inherent complexity in real world networks, as they're often comprised of thousands of nodes that interact in specific and complicated fashions. Furthermore, real world network research is hindered by the relatively few data sources with which to work, and the time required for such data sources to mature. Given these parameters, networks are wonderful candidates for computer simulation. This project has utilized Swarm software to model and analyze celluar networks. Individual cells were modelled as agents and the resulting topology of they're interactions were analyzed.

Bianconi, G., A.-L. Barabási, *Competition and multiscaling in evolving networks,* Europhysics Letters 54 (4), 436-442 (2001).

E. Ravasz, A. L. Somera, D. A. Mongru, Z. N. Oltvai,
and A.-L. Barabási, Hierarchical organization of modularity in metabolic networks, Science 297, 1551-1555 (2002).

Hawoong Jeong, Sean Mason, Albert-László Barabási
and Zoltan N. Oltvai, *Lethality and centrality in protein networks,* Nature 411, 41-42 (2001).

Bonabeau, Eric, "Biological and Economic Network" Making Sense Of Networks
4 MAY 1999

Wagner, Andeas, The large-scale structure of metabolic networks: A glimpse at life's origin?, Complexity Volume 8, Issue 1, 2002

Schuster, Peter, Peter F. Stadler, Networks in molecular evolution, Complexity Volume 8, Issue 1, 2002