

IEEE CIS/IAS SEMINAR

Co-sponsored by UMR's Intelligent Systems Center

Dipankar Dasgupta

Professor of Computer Science, University of Memphis

Director of Center for Information Assurance and Intelligent Security Systems Research Lab (ISSRL)

Computational Intelligence in Cyber Security

Computational Intelligence techniques have proven to be flexible in decision making in dynamic environment. They typically include Fuzzy Logic, Evolutionary Computation, Intelligent Agent Systems, Neural Networks, Cellular Automata, Artificial Immune Systems, and other similar computational models. The use of these techniques allowed building efficient and robust decision support modules, providing cross-linking solutions to different cyber security applications.

With the proliferation of complex distributed and Internet computing, information security and privacy become very important. In order to protect large cyber infrastructure, we need flexible, adaptable and robust cyber defense systems, which can make intelligent decisions (in near real-time) in detecting wide variety of threats and attacks, including active and passive attacks, external attacks and internal misuses, known and unknown attacks, viruses and spam, etc. Computational Intelligent (CI) techniques seem promising to enhance cyber security measures, and have been increasingly applied in the area of information security and information assurance. The field of CI is a multi-faceted approach which appears to provide a new security paradigm to deal with influx of new threats in a large network of computers.

This talk will be devoted to the application of the state-of-the-art CI-based technologies -- fuzzy systems, evolutionary computation, genetic programming, neural networks and artificial immune systems, and highlight how artificial immune systems play critical roles in various computer and information security problems.

Monday, March 12 3:00 – 4:30 pm

University of Missouri - Rolla

G-31 Emerson Electric Co. Hall

Prof. Dasgupta's research interests broadly span the areas of scientific computing, tracking real-world problems through interdisciplinary cooperation. His areas of special interests include Artificial Immune Systems, Genetic Algorithms, Neural Networks, multi-agent systems and their applications. He received funding from different federal organizations including NAVY, NSF, and DARPA for his research. He published more than 125 research papers in book chapters, journals, and international conferences. He published two edited books and co-edited several conference proceedings over the last 10 years. Prof. Dasgupta made significant contribution in the field of Computational Intelligence; it is visible from breadth and depth of his research (publications, talks, grants) and his stature in the scientific community. In particular, he is one of the leading authorities of the emerging research area, Artificial Immune Systems, and also done seminal work in genetic algorithms which are now being explored by others.

One of his current research interests are in Network and Internet security, in particular, applying intelligent agents, genetic algorithms, neural networks, Fuzzy Logic and immune system techniques in the area of computer security. He is the founder of a *Network Security Lab* for doing research, and training on Security related issues (our lab website: <http://issrl.cs.memphis.edu>). He also the director of the Center of Excellence in Information Assurance (CAE/IA) (<http://cfia.memphis.edu>), designated by National Security Agency (NSA) and the Department of Homeland Security (DHS).