Steps Toward Self-Aware Networks

Erol Gelenbe, Professor, Imperial College, London
November 12, 2009, 12:30 pm, NAC 5/111

We will present the design of a packet network where paths are dynamically selected based on quality of service (QoS) metrics that can be specified by the users of the network or by the network's access points. The approach uses on-line measurement associated with the traffic itself, and reinforcement learning throughout the nodes of the network, to try to satisfy the users' QoS objectives. The talk will present numerous measurement studies of this approach on a large laboratory test-bed. The presentation is based on our recent paper in the Communications of the ACM (July 2009), which integrates many aspects of our research including network design, performance evaluation techniques, and biologically inspired neuronal networks.

About the speaker: Erol Gelenbe received his PhD in Electrical Engineering from Brooklyn Poly and his Doctorat d'Etat in Mathematical Sciences from the University of Paris. Since 2003 he has been on the faculty of Imperial College London, where he currently is the Professor in the Dennis Gabor Chair. He is a Fellow of the IEEE and Fellow of the ACM, a member of the French National Academy of Engineering (http://www.academie-technologies.fr) and of the Turkish Academy of Sciences (http://www.tuba.gov.tr). In 2008 he received the ACM SIGMETRICS Life-Time Achievement Award, and in recent years was awarded several "honoris causa" doctorates and governmental honors from Belgium, France, Italy and Turkey. Erol's recent work has appeared in Comm. ACM, ACM Transactions on Adaptive and Autonomous Systems, ACM Transactions on Sensor Networks, ACM Transactions on Internet Technology, The Computer Journal, Neural Computation, Physical Review E, and the Proceedings of the Royal Society. He is funded by EPSRC (similar to NSF), the EU FP7 Program, and several companies including British Telecom and BAE Systems.