

## IEEE ICCCN 2007 Keynote Speakers

**Dr. Robert E. Kahn** (NAE Member, IEEE/AAAI/ACM Fellow)

(Co-inventor of the Internet, Turing Award Winner)

President, CEO & Chairman  
Corporation for National Research Initiatives, USA

**Keynote Title:** Managing Digital Objects on the Internet

**Abstract:** All types of information may be structured as digital objects. These may be subject to rights, require privacy or demand security. Some may be inaccessible without permission (eg. Behind firewalls) may move from place to place, or exist at multiple locations. Some may need to be accessible for very long period of time. An overall framework in which to address these issues will be presented and their relevance to network operations and management will be discussed.



**Bio:** Robert E. Kahn is Chairman, CEO and President of the Corporation for National Research Initiatives (CNRI), which he founded in 1986 after a thirteen year term at the U.S. Defense Advanced Research Projects Agency (DARPA). CNRI was created as a not-for-profit organization to provide leadership and funding for research and development of the National Information Infrastructure.

After receiving a B.E.E. from the City College of New York in 1960, Dr. Kahn earned M.A. and Ph.D. degrees from Princeton University in 1962 and 1964 respectively. He worked on the Technical Staff at Bell Laboratories and then became an Assistant Professor of Electrical Engineering at MIT. He took a leave of absence from MIT to join Bolt Beranek and Newman, where he was responsible for the system design of the Arpanet, the first packet-switched network. In 1972 he moved to DARPA and subsequently became Director of DARPA's Information Processing Techniques Office (IPTO). While Director of IPTO he initiated the United States government's billion dollar Strategic Computing Program, the largest computer research and development program ever undertaken by the federal government. Dr. Kahn conceived the idea of open-architecture networking. He is a co-inventor of the TCP/IP protocols and was responsible for originating DARPA's Internet Program. Until recently, CNRI provided the Secretariat for the Internet Engineering Task Force (IETF). Dr. Kahn also coined the term National Information Infrastructure (NII) in the mid 1980s which later became more widely known as the Information Super Highway.

In his recent work, Dr. Kahn has been developing the concept of a digital object architecture as a key middleware component of the NII. This notion is providing a framework for interoperability of heterogeneous information systems and is being used in many applications such as the Digital Object Identifier (DOI). He is a co-inventor of Knowbot programs, mobile software agents in the network environment.

Dr. Kahn is a member of the National Academy of Engineering and a former member of its Computer Science and Technology Board, a Fellow of the IEEE, a Fellow of AAI, a Fellow of ACM and a Fellow of the Computer History Museum. He is a former member of the President's Information Technology Advisory Committee, a former member of the Board of Regents of the National Library of Medicine and the President's Advisory Council on the National Information Infrastructure.

He is a recipient of the AFIPS Harry Goode Memorial Award, the Marconi Award, the ACM SIGCOMM Award, the President's Award from ACM, the IEEE Koji Kobayashi Computer and Communications Award, the IEEE Alexander Graham Bell Medal, the IEEE Third Millennium Medal, the ACM Software

Systems Award, the Computerworld/Smithsonian Award, the ASIS Special Award and the Public Service Award from the Computing Research Board. He has twice received the Secretary of Defense Civilian Service Award. He is a recipient of the 1997 National Medal of Technology, the 2001 Charles Stark Draper Prize from the National Academy of Engineering, the 2002 Prince of Asturias Award, and the 2004 A. M. Turing Award from the Association for Computing Machinery. Dr. Kahn received the 2003 Digital ID World award for the Digital Object Architecture as a significant contribution (technology, policy or social) to the digital identity industry. In 2005, he was awarded the Townsend Harris Medal from the Alumni Association of the City College of New York, the Presidential Medal of Freedom, and the C & C Prize in Tokyo, Japan. He was inducted into the National Inventors Hall of Fame in May 2006.

Dr. Kahn has received honorary degrees from Princeton University, University of Pavia, ETH Zurich, University of Maryland, George Mason University, the University of Central Florida and the University of Pisa, and an honorary fellowship from University College, London.

## **Dr. Vijay K. Bhargava (IEEE Fellow)**

Professor and Head, Dept. of Electrical and Computer Engineering

The University of British Columbia, Canada

**Keynote Title:** Research Challenges in Cognitive Radio Networks

**Abstract:** The cognitive radio technology will allow a group of potential users to identify and access available spectrum resources provided that the interference to users for whom the band has been licensed is kept below a prescribed level. This research area is at an early stage because various research challenges have to be addressed and solved. In this talk we present an overview of some research issues for cognitive radio networks. Specifically, we present some research and developments in cognitive radio networks with focus on: i) information-theoretic aspects, ii) spectrum sensing, iii) link adaptation, iv) advanced transceiver design, and v) admission control. We discuss research problems related to these specific topics that need to be discussed before deployment of cognitive radio systems. The presentation concludes with a rendition of “Ya Moustafa, Ya Moustafa” and its relation to cognitive radios!



**Bio:** Vijay K. Bhargava received his B.Sc., M.Sc. and Ph.D. degrees from Queen's University, Kingston, Ontario in 1970, 1972 and 1974 respectively. Vijay has held regular/visiting appointments at the Indian Institute of Science, University of Waterloo, Concordia University, Ecole Polytechnique de Montreal, UNIDO, NTT Wireless Communications Labs, Tokyo Institute of Technology, University of Indonesia, the Hong Kong University of Science and Technology, The Hong Kong University and the University of Victoria. Currently he is a professor and Head of the Department of Electrical and Computer Engineering at the University of British Columbia.

Vijay served as the Founder and President of "Binary Communications Inc." (1983-2000). He has provided consulting services to several companies and government agencies. He is a co-author (with D. Haccoun, R. Matyas and P. Nuspl) of "Digital Communications by Satellite" (New York: Wiley 1981), a co-editor (with S. Wicker) of "Reed Solomon Codes and their Applications" (IEEE Press 1994) and a co-editor (with V. Poor, V. Tarokh and S. Yoon) of "Communications, Information and Network Security" (Kluwer: 2003) and a co-editor (with E. Hossain) of "Cognitive Wireless Communications Networks" (Springer: 2007). He has served as Editor for the IEEE Transactions on Wireless Communications and the IEEE Transactions on Communications. In January 2007, he was appointed Editor-in-Chief of the IEEE Transactions on Wireless Communications.

A Fellow of the IEEE, the Engineering Institute of Canada (EIC), the Royal Society of Canada, and the Canadian Academy of Engineering, Vijay has been honoured many times by his colleagues and has received numerous awards. Vijay is very active in the IEEE and has served as the President of the Information Theory Society, Vice President for Regional Activities Board, Director of Region 7, Montreal Section Chair and Victoria Section Chair. He is a past member of the Board of Governors of the IEEE Communications Society and the IEEE Information Theory Society. He was nominated by the IEEE BoD as a candidate for the office of President-Elect in 1996, 2002 and 2003. His current research interest is adaptive wireless access system design for cognitive radio networks.

**Dr. Aggelos K. Katsaggelos (IEEE Fellow)**

Professor, Department of EECS  
Northwestern University, USA



**Keynote Title:** Challenges and Opportunities in Video  
Transmission

**Abstract:** Supporting video communication over lossy channels such as wireless networks and the Internet is a challenging task due to the stringent quality of service (QoS) required by video applications and the many channel impairments. Two important QoS characteristics for video are the degree of signal distortion and the transmission delay. Another important consideration is the cost associated with transmission, for example, the energy consumption in the wireless channel case and the cost for differentiated services in the Internet (with DiffServ) case.

In this presentation we consider the joint adaptation of the source coding parameters, such as the quantization step-size and prediction mode, along with the physical layer resources, such as the transmission rate and power. Our goal is to provide acceptable QoS while taking into account system constraints such as the energy utilization. We discuss a general framework that allows a number of "resource/distortion" optimal formulations for balancing the requirements of different applications. We conclude the presentation with some of the grand opportunities and challenges in designing and developing video communication systems.

**Bio:** Aggelos K. Katsaggelos received the Diploma degree in electrical and mechanical engineering from the Aristotelian University of Thessaloniki, Greece, in 1979 and the M.S. and Ph.D. degrees both in electrical engineering from the Georgia Institute of Technology, in 1981 and 1985, respectively. In 1985 he joined the Department of Electrical Engineering and Computer Science at Northwestern University, where he is currently professor. He is also the Director of the Motorola Center for Seamless Communications and a member of the Academic Affiliate Staff, Department of Medicine, at Evanston Hospital.

Dr. Katsaggelos is a member of the Publication Board of the IEEE Proceedings, the IEEE Technical Committees on Visual Signal Processing and Communications, and Multimedia Signal Processing, the Editorial Board of Academic Press, Marcel Dekker: Signal Processing Series, Applied Signal Processing, and Computer Journal. He has served as editor-in-chief of the IEEE Signal Processing Magazine (1997-2002), a member of the Publication Boards of the IEEE Signal Processing Society, the IEEE TAB Magazine Committee, an Associate editor for the IEEE Transactions on Signal Processing (1990-1992), an area editor for the journal Graphical Models and Image Processing (1992-1995), a member of the Steering Committees of the IEEE Transactions on Image Processing (1992-1997) and the IEEE Transactions on Medical Imaging (1990-1999), a member of the IEEE Technical Committee on Image and Multi-Dimensional Signal Processing (1992-1998), and a member of the Board of Governors of the IEEE Signal Processing Society (1999-2001). He is the editor of Digital Image Restoration (Springer-Verlag 1991), co-author of Rate-Distortion Based Video Compression (Kluwer 1997), co-editor of Recovery Techniques for Image and Video Compression and Transmission, (Kluwer 1998), and co-author of Super-Resolution for Images and Video, (Morgan and Claypool, 2007), and co-author of Joint Source-Channel Video Transmission (Morgan and Claypool 2007). He was the holder of the Ameritech Chair of Information Technology (1997-2003), and he is the co-inventor of twelve international patents, a Fellow of the IEEE, and the recipient of the IEEE Third Millennium Medal (2000), the IEEE Signal Processing Society Meritorious Service Award (2001), an IEEE Signal Processing Society Best Paper Award (2001), and an IEEE ICME Best Paper Award (2006). He is a Distinguished Lecturer of the IEEE Signal Processing Society for 2007-2008.

## Dr. Cheng-Zhong Xu

Professor, Department of Electrical and Computer Engineering

Wayne State University, USA

**Keynote Title:** Quality Control: A Key to Stress-Resilient Internet Services

**Abstract:** Today's Internet services are largely vulnerable to flash crowds-like DDoS attacks because the visits in such attacks often bear much resemblance to normal accesses and most of them cannot be detected with certainty. Current same-service-to-all models can hardly protect the interests of legitimate clients from the interference of suspicious traffic. Application-level quality control in edge servers relies on autonomic resource management technologies to offer different levels of service quality to different classes of traffic according to server load conditions. By downgrading the performance of aggressive visits, the model ensures resource fair sharing and builds a firewall around legitimate clients. Because the quality control model can isolate the performance of different traffic in stressed servers, it also offers a strong incentive for differentiated pricing policies for the next generation of Internet services. Challenge issues with the quality control model will be discussed. An autonomic quality control framework for web servers will be presented.



**Bio:** Cheng-Zhong Xu is a professor in the Department of Electrical and Computer Engineering of Wayne State University. His research interests are mainly in networked computer systems, particularly in scalable and secure Internet services, autonomic server management, energy-aware scheduling in embedded systems, and high performance cluster and grid computing. He has published more than 100 peer-reviewed journal and conference articles in these areas. He is the author of "Scalable and Secure Internet Services and Architecture" (Chapman & Hall/CRC Press, 2005) and a co-author of "Load Balancing in Parallel Computers: Theory and Practice" (Kluwer Academic/ Springer-Verlag, 1996). Dr. Xu serves on a number of journal editorial boards including Journal of Parallel and Distributed Computing, Journal of Parallel, Emergent, and Distributed Systems, Journal of High Performance Computing and Networking, and Journal of Computers and Applications. He has also served in numerous conference organization and program committees. He was the founding co-chair of International Workshop on Security in Systems and Networks(SSN), a general co-chair of the IFIP 2006 International Conference on Embedded and Ubiquitous Computing (EUC'06), and a program co-chair of the 2007 International Conference on Grid and Cooperative Computing (GCC'07). He is a recipient of "Faculty Research Award" of Wayne State University in 2000, President's Award for Excellence in Teaching in 2002, and Career Development Chair Award in 2003. Dr. Xu received BS and MS degrees from Nanjing University in 1986 and 1989, respectively, and a Ph.D. degree from the University of Hong Kong in 1993, all in computer science. He is a senior member of IEEE and a member of ACM.