



THE CHINESE UNIVERSITY OF HONG KONG

Department of Information Engineering

Seminar

Networking Across Mobile Wireless Networks

by

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Date : 30 March, 2010 (Tue.)

Time : 11:00am – 12:00noon

**Venue : Room 833, Ho Sin Hang Engineering Building
The Chinese University of Hong Kong**

Abstract

We overview selected research developments obtained recently in our group that relate to networking across infrastructure and mobile ad hoc wireless networks. Topics are selected from the following developments:

- a. *Networking across mobile ad hoc wireless networks through the use of our Mobile Backbone Network (MBN) techniques.* Algorithms and protocols have been developed and studied to dynamically synthesize a mobile backbone topology and to enable QoS routing across such an hierarchically constructed network.
- b. *Cross-layer operations across mobile wireless networks.* Techniques for the combined selection and setting of modulation/coding schemes, transmit power levels, rate adaptations, MAC scheduling and routing procedures. We have been applying such studies to a wide range of networking systems, including WLAN, WMAN and cellular architectures. Energy aware operations have also been extensively studied, with applications to networks whose subscribers use energy limited devices, such as sensor networks. Fundamental performance bounds that involve code, rate and power adaptations have been attained.
- c. *Traffic and routing management of multi-segment networks* in which gateway end nodes may employ multiple simultaneous routes to navigate traffic across different media. Utility oriented optimal traffic distribution across terrestrial and space based network segments.

Biography

Izhak Rubin received the B.Sc. and M.Sc. from the Technion - Israel Institute of Technology, Haifa, Israel, in 1964 and 1968, respectively, and the Ph.D. degree from Princeton University, Princeton, NJ, in 1970, all in Electrical Engineering. Since 1970, he has been on the faculty of the UCLA School of Engineering and Applied Science where he is currently a Distinguished Professor in the Electrical Engineering Department. He has had extensive research, publications, consulting, and industrial experience in the design and analysis of commercial and military computer communications and telecommunications systems and networks. Recent R&D projects include network design, simulation, management, and planning tools for network modeling and analysis, multi-task resource allocation, unmanned vehicle aided multi-tier ad hoc wireless communications networks and such systems that autonomously support the operation of distributed sensor networks. During 1979-1980, he served as Acting Chief Scientist of the Xerox Telecommunications Network. He served as co-chairman of the 1981 IEEE International Symposium on Information Theory; as program chairman of the 1984 NSF-UCLA workshop on Personal Communications; as program chairman for the 1987 IEEE INFOCOM conference; and as program co-chair of the IEEE 1993 workshop on Local and Metropolitan Area networks. He served as co-chair of the 2002 first UCLA/ONR Symposium on Autonomous Intelligent Networked Systems, and has organized many other conferences and workshops. He has served as an editor of the *IEEE Transactions on Communications*, *Wireless Networks* journal, *Optical Networks* magazine, *IEEE JSAC* issue on MAC techniques, *Communications Systems* journal, *Photonic Networks Communications* journal, and has contributed chapters to texts and encyclopedia on telecommunications systems and networks. Dr. Rubin is a Life Fellow of IEEE.

**** ALL ARE WELCOME ****