



The University of New South Wales  
Faculty of Engineering  
School of Electrical Engineering & Telecom



## Invited Lecture

### New Results on the Throughput and Delay of Packet Radio Links

**Aria Nosratinia, *IEEE Fellow***  
**Professor, Department of Electrical Engineering**  
**University of Texas at Dallas, USA**



**Date: 16 December 2009, Wednesday**  
**Time: 11:00 a.m. – 12:00 noon**  
**Venue: G3, Electrical Engineering Building**

#### Abstract

New results will be presented on the throughput and delay of packet radio links under block fading and general hidden Markovian fading. It is well-known that the throughput of the selective repeat ARQ in a channel with erasure rate  $e$  is  $(1-e)$ . Unfortunately, such simple results break down when the feedback channel is less than ideal. This talk presents a systematic method for analyzing various throughput problems in the presence of errors in both the forward and reverse channels, as well as link timeouts. This is achieved via a generalization of Mason graphs to include matrix-valued link gains. The talk starts with a tutorial on the Mason graph technique for calculating throughput. We will then visit both selective-repeat as well as go-back-N ARQ on two classes of wireless channels: the block fading channel and the correlated fading channel. We will discuss some of the practical benefits of this new analysis for wireless network engineers.

#### Biography

Professor Aria Nosratinia is professor of Electrical Engineering at the University of Texas at Dallas, where he is also the director of the Multimedia Communications Laboratory. He received his Ph.D. in Electrical and Computer Engineering from the University of Illinois at Urbana-Champaign. He has held visiting appointments at Princeton University, Rice University, and UCLA. His interests lie in the broad area of information theory and signal processing, with applications in wireless communications and medical imaging. His recent work has been on relays and cooperative communication, cross-layer issues in communications, and functional Magnetic Resonance Imaging (fMRI). He currently serves as editor for the IEEE Transactions on Information Theory, and IEEE Transactions on Wireless Communications, and serves on the Board of Governors of the IEEE Information Theory Society. He has also been an editor for the IEEE Transactions on Image Processing, IEEE Signal Processing Letters, IEEE Wireless Communications (Magazine), and Journal of Circuits, Systems, and Computers. He has been the recipient of the National Science Foundation career award. He is a Fellow of the IEEE.

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**ALL ARE WELCOME**

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**For ENQUIRIES: Dr. Wei Zhang (Ph: 9385 4033)**