



THE CHINESE UNIVERSITY OF HONG KONG  
Institute of Network Coding  
and  
Department of Information Engineering  
*Seminar*



## Linear and Nonlinear Iterative Multiuser Detection

by

**Prof. Alex J. Grant**  
**University of South Australia**

**Date : 03 October 2011 (Monday)**  
**Time : 4:30 - 5:30 pm**  
**Venue : Room 1009, William M. W. Mong Engineering Building**  
**The Chinese University of Hong Kong**

### Abstract

Multiuser detection can greatly increase the spectral efficiency of multiple-access communications systems. One low-complexity approach to the design of multiuser detection algorithms is serial or parallel interference cancellation. In this talk, I will give show how a wide range of linear iterative multiuser detection algorithms fall within known frameworks for iterative matrix inversion. This provides a rich array of analytical tools, and also motivates some new approaches. I will also show how non-linear cancellation can improve performance and describe some theoretical results which reveal these nonlinear iterations as solutions to certain constrained optimisation problems.

### Biography

Alex J. Grant (S '93 - M '96 - SM '03) received the B.E. and Ph.D. degrees from the University of South Australia, in 1993 and 1996, respectively. In 1997, he was a Postdoctoral Research Fellow at the Laboratory for Signal and Information Processing, ETH Zurich. Since March 1998, he has been with the Institute for Telecommunication Research, University of South Australia, where he is now Director and Research Professor of Information Theory. Prof. Grant served as Chairman for the IEEE SA/ACT/Vic Sections Information Theory Society Joint Chapter (2000-2003). He served as Technical Co-Chair for the 2001 (Cairns) and 2009 (Taormina, Italy) IEEE Information Theory Workshop and as general Co-Chair for the 2005 IEEE International Symposium on Information Theory, Adelaide, Australia. He is a Member of the Board of Governors of the IEEE Information Theory Society, and has served as an Associate Editor for the IEEE Transactions on Information Theory and for the IEEE Transactions on Wireless Communications.

Prof. Grant is co-founder of Cohda Wireless, a leading developer of Safe Vehicle and Connected Vehicle design solutions and services for public safety, outdoor, and automotive wireless-based systems.

**\*\*ALL ARE WELCOME \*\***