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National ICT Australia invites you to the Victoria Research Laboratory Big Picture Seminar Series Tuesday September 30, 2008

REGISTRATION IS ESSENTIAL FOR THIS FREE EVENT

RSVP to vr1ss@nicta.com.au by Wednesday 26 September, 2008

Public Parking is available at an hourly rate at the University Square car park. Enter via Bouverie Street. Local street parking is also available.



When: 5pm Canapes, for 6pm Start

Where: Brown Theatre, Electrical & Electronic Engineering (Building 193), University of Melbourne, Parkville

fred harris, San Diego State University

Digital Signal Processing in Next Generation Communication Systems

ABSTRACT: Imagine a modern communication system without the enabling technology of Digital Signal Processing. Difficult isn't it? That was actually a trick question! Modern communication systems are not possible without DSP! I said it and I'll stand by it! While first generation communication systems managed quite well without DSP, second generation systems derived great benefit from DSP, and third and fourth generation systems could not exist without DSP. In second generation systems DSP was used to perform many of the standard signal conditioning and signal processing tasks of conventional modulators and demodulators. A number of considerations assure us that the DSP versions out perform the legacy analog systems. In third generation systems DSP is used to accomplish amazing feats of performance that have no counterpart in the analog systems. These include Wide Dynamic Range Image Reject Filters, Adaptive Channel Equalization, Adaptive Intrusion Cancellation, I-Q balancing, Cross-Talk Suppression, Signal-Path Equalization, DC-Canceling, Peak-to-Average Power Ratio control, Power Amplifier Linearization, Third Order Cross-Talk Suppression, Variable Bandwidth filters, Maximum Likelihood Timing and Carrier Recovery, Maximum Likelihood Frequency Acquisition, Preamble Based System Acquisition, Source Coding of all kinds, smart AGC, and on and on. Have we tickled your interest yet? A true funny Story: A reviewer of a paper I had written on "DSP in Microwave Receivers" posed the question "Why would a microwave designer care about DSP?" My initial response was "Because Gordon More is coming to eat your lunch!" If you do not understand that answer you then assuredly should attend this short talk.

BIOGRAPHY: fredric j harris holds the CUBIC Signal Processing Chair of the Communication Systems and Signal Processing Institute at San Diego State University, where since 1967, he has taught courses in Digital Signal Processing and Communication Systems. He holds a number of patents on digital receiver and DSP technology and lectures throughout the world on DSP applications. He consults for organizations requiring high performance, cost effective DSP solutions. fred is an adjunct member of the Institute for Defense Analysis, Center for Communications Research at Princeton, NJ. He has written over 150 journal and conference papers, and written, or contributed to, a number of DSP books. He became a Fellow of the IEEE in 2003, cited for contributions of DSP to communications systems. In 2006 he received the Software Defined Radio Forum's "Industry Achievement Award". The spelling of his name with all lower case letters is a source of distress for typists and spell checkers. A child at heart, he collects toy trains and old slide-rules.

