

To enrol please complete this form, enclose your seminar fee and mail prior to 24th March, 2005 to:

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course

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The Institute reserves the right to cancel the seminar or change seminar contents. In the event that the seminar is cancelled participants will receive a full refund.

Presenters

Donald Bailey

Donald is a Senior Lecturer in the Institute of Information Sciences and Technology at Massey University. He has 20 years experience, primarily in image processing but also in signal processing. His work has involved applying image analysis techniques in both the forest and wool industries. He has also worked on a range of projects at the University of California at Santa Barbara as well as Massey University. Donald has extensive experience in developing algorithms for image and signal processing applications.

Liyanage C De Silva

Liyanage is a Senior Lecturer in the Institute of Information Sciences and Technology at Massey University. He has 15 years experience in image and signal processing at the University of Tokyo, the Advanced Telecommunications Research Centre (Japan) and the National University of Singapore. Liyanage has a patent on a bimodel expression analysis technique using video and audio signals for emotion recognition.

Amal Punchihewa

Amal is a Lecturer in the Institute of Information Sciences and Technology at Massey University. He previously worked for Phillips in the Netherlands researching in the area of video signal processing and spent 9 years in the television broadcasting area in Sri Lanka where he pioneered the introduction of Nicam multilingual sound broadcast and ghost cancellation reference transmission. His areas of interest include communications, video coding, and coding artefacts.

Xiang Gui

Xiang is a Lecturer in the Institute of Information Sciences and Technology at Massey University. He has 10 years experience in the area of wireless and mobile communications at the University of Hong Kong, and Nanyang Technological University in Singapore. His research interests include wireless and mobile communications and applications, multicarrier and spread spectrum systems, and communication networks.

Richard Harris

Richard obtained his PhD from the University of Adelaide in 1974 in the area of optimal design of telephone networks. He spent 15 years working in Telecom Australia in the Fundamental Planning Branch and the Telstra Research Laboratories. In 1989 he was appointed an Associate Professor at Bond University as Deputy Director of the Centre for Telecommunication Network Research. He moved to RMIT in early 1993 as Director of the Centre for Advanced Technology in Telecommunications (CATT) and Professor of Communication Systems. In 2005 he was appointed to a Chair in Telecommunications and Network Engineering at Massey University. His current interests include teletraffic engineering, communication switching, Internet engineering, network design and optimisation, network traffic management and network performance.

Massey University

Massey University is one of New Zealand's leading educational institutions. It has 4 campuses, and provides a choice of over 200 degrees, certificates and diplomas. In 2003 Massey had a total of 40,000 students, 21,000 of whom were studying by distance. The university has a proud 76-year tradition of academic and research excellence combined with a strong national and international reputation. The Institute of Information Sciences and Technology is Massey University's focal point for quality education and research in the broad areas of Information & Telecommunications, Computer Systems, and Software Engineering.

course content

course information

DIGITAL SIGNAL PROCESSING

Day 1: DSP Refresher

DSP Fundamentals

- Linear systems
- Convolution
- Frequency domain basics
- Sampling and reconstruction

DSP in the Frequency Domain

- Discrete Fourier transform
- Fast Fourier transform
- Z transform

Filter Design

- Filter structures
- Filter design techniques

Day 2: Advanced DSP

Architects for DSP

- DSP Processors
- FPGA implementation

DSP Analysis of Signals

- Short time Fourier transform
- Windowing and spectral leakage
- Tradeoff between time and frequency resolution
- Multirate signal processing
- Wavelets

Advanced Filter Design

- Adaptive filters
- Advanced structures

Day 3: DSP Applications

- Overcoming aliasing with super-resolution
- Ultra wideband communication using OFDM
- Blind source separation
- Ghost cancellation in TV receivers
- Speech processing (Analysis & coding)

About the course

In today's society, examples of signal processing, and in particular digital signal processing (DSP) systems abound. Applications of DSP include: home entertainment systems, control systems, telecommunication systems, mobile phones, automobiles, instrumentation. Digital audio and digital video are resulting in DSP becoming all pervasive. This course is designed to concisely introduce the fundamentals of digital signals and their processing. This is followed with examples of practical applications of signal processing.

This course will enable participants to:

- understand the concepts and terminologies employed in digital signal processing
- gain knowledge of the principles underlying the design and development of digital filters
- comprehend the application of these techniques in a broad range of areas
- obtain hands on experience of signal processing algorithms

Who should attend?

This course is aimed at engineers, scientists and managers who need to understand the basic concepts of the Digital Signal Processing techniques and their applications. Participants will be expected to have some background in basic electronics, mathematics, and programming. Prior background in digital signal processing would be helpful but not required.

Method of instruction

The course will consist of a series of well illustrated lectures that cover the theory, followed by practical hands-on laboratories. The laboratories will involve simulation of signal processing systems using MATLAB, and real-time processing of signals using the TMS320C5402 DSP.

Course dates and venue

6th - 8th April, 2005 (9:00 am - 5.00 pm), Massey University, Palmerston North Campus. Registration from 8.30am Wednesday 6th April.

Course fee

\$1250 (includes cost of computer usage, course material, handouts, lunches & teas).



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