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STATE SPACE REALIZATION OF A 3D IMAGE SET WITH APPLICATION TO NOISE REDUCTION OF FLUORESCENT IMAGES

Sponsored by: IEEE Circuits and Systems Society Distinguished Lecture Program

Date and Time: 4th December 2008 (Thursday), 10:00 AM
Venue: Analog and Mixed-Signal VLSI Lab, Silver Jubilee Building, JLG 211-212, University of Macau

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Abstract: A new method is presented to calculate state space realizations of a three-dimensional (3D) image set. It is based on interpreting the image set as the impulse response of a 3D separable system. The proposed realization algorithm consists of two parts:

1.) Decomposition of a 3D image set into the product of three 1D components;

2.) Balanced state space realizations of finite 1D sequence.

The proposed method can be used for realizing the given 3D images exactly or approximately. The advantage of the method is noise can be reduced with little degradation on the image quality. It has been successfully applied in noise reduction of various 3D image sets of fluorescently labeled cells acquired by a fluorescent microscope. It can be used for noise reduction in a 3D image set or for noise suppression of a point spread function (PSF) which is an essential component in any 3D deconvolution algorithms.

Biography: **Zhiping Lin** received the B.Eng degree in control engineering from South China Institute of Technology, Canton, China in 1982 and the Ph.D. degree in information engineering from the University of Cambridge, England in 1987. He was with the University of Calgary, Canada from 1987 to 1988, with Shantou University, China from 1988 to 1993, and with DSO National Laboratories, Singapore from 1993 to 1999. Since Feb. 1999, he has been an Associate Professor at Nanyang Technological University (NTU), Singapore. He is also the Program Director of Bio-Signal Processing, Center for Signal Processing, NTU. Dr. Lin was an editorial board member of Multidimensional Systems and Signal Processing (MSSP) from 1993 to 2004, and has been a Co-Editor of MSSP since 2005. Dr. Lin was a Guest Co-Editor for the special issue of "Applications of Grobner Bases in Multidimensional Systems and Signal Processing" published in MSSP in 2001, and was an Associate Editor of Circuits, Systems and Signal Processing (CSSP) from 2000 to 2007. His research interests include multidimensional systems and signal processing, radar and array signal processing, and biomedical signal processing. He is a Distinguished Lecturer of the IEEE Circuits and Systems Society for 2007-2008, and the Chair of the IEEE Circuits and Systems Singapore Chapter for 2007-2008.

The lectures are open to the public

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