

Distinguished Lecture Series 2008

Direct Design of Orthogonal Filter Banks and Wavelets by Sequential Convex Quadratic Programming

by

Professor Wu-Sheng Lu

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Date: 9 September 2008, Tuesday

Time: 2:30 p.m. – 3:30 p.m.

Venue: Room 513, 5/F, William M.W. Mong Engg., CUHK

Abstracts

Two-channel conjugate quadratic (CQ) FIR filter banks are among the most popular building blocks for multirate systems as they offer precise perfect reconstruction property. Most design methods for CQ filters are indirect in that a halfband filter with nonnegativity constraint is designed, followed by a spectrum factorization. This talk describes a direct method that does not require designing the halfband filter and its factorization, and integrates least-square and minimax designs with or without vanishing moment requirement into a single design framework. Examples are supplied to help examine design performance, efficiency, and its ability of getting global solutions.

Biography of the Speaker

Wu-Sheng Lu received his undergraduate education in mathematics from Fudan University, Shanghai, China, from 1959 to 1964, the M.S. degree in electrical engineering, and the Ph.D. degree in control science from the University of Minnesota, Minneapolis, USA, in 1983 and 1984, respectively. He was a post-doctoral fellow at the University of Victoria, Victoria, B.C., Canada, in 1985 and was a visiting Assistant Professor at the University of Minnesota from January 1986 to April 1987. In May 1987, he joined the Electrical and Computer Engineering Department, University of Victoria, as an Associate Professor, and has been Professor there since 1991. He is the co-author with A. Antoniou of *Two-Dimensional Digital Filters* (Marcel Dekker, 1992) and *Practical Optimization: Algorithms and Engineering Applications* (Springer, 2007).

Dr. Lu has held Guest Professor positions at several academic institutions, including the National Taiwan University (1996), Hiroshima University, Japan (1998, 2002), Tampere University of Technology, Finland (2002), and the East China Normal University, China (1998 - present). He served as an Associate Editor of the *Canadian Journal of Electrical and Computer Engineering* in 1989, and was Editor of the same journal from 1990 to 1992. He was an Associate Editor of the *IEEE Transactions on Circuits and Systems II* from 1993 to 1995, for *IEEE Transactions on Circuits and Systems I* from 1999 to 2001 and from 2004 to 2005, and for the *International Journal of Multidimensional Systems and Signal Processing* from 1997 to 2006.

Dr. Lu was elected Fellow of the Engineering Institute of Canada in 1994. He was elected Fellow of the IEEE in 1999 for contributions to the analysis and design of multidimensional and multirate digital filters and discrete systems.

*** ALL ARE WELCOME ***

For ENQUIRIES: Tel: 3163 4351/ 2609 8486

** Light refreshment will be served after the lecture on 5/F **