

Sparse Orthonormal Transforms: A New Framework for Data Representation

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Abstract:

In this talk, I will first give a brief introduction to video/image compression methods with possible directions for research in next-generation applications. Then, I will talk about the path we are taking for video/image compression research. The main focus of this talk, therefore, will be on a new framework that we have recently proposed for transform optimization. What makes the proposed method interesting is that it is very generic and can be applied to optimize any existing data compression method or to design new ones. To be more specific, with the proposed data-driven optimization process, one can produce bi-orthogonal or orthogonal transforms having block, lapped, or wavelet structures. I will show some promising results obtained in image compression and denoising that make the proposed method competitive with state-of-the-art methods.

Biography:

Born in Istanbul, Turkey, Osman G. Sezer received his BS degree in Electrical Eng. from Bogazici University, Istanbul, Turkey. He holds MS degrees from both Sabanci University and Georgia Tech, and still pursues his Ph.D. in Center for Signal and Image Processing at Georgia Tech. The focus of his research has been on various aspects of image/video processing from pattern recognition to data compression. For last three years, he has mostly been involved with next-generation video/image compression algorithms by collaborating with researchers at Docomo USA Labs and Texas Instruments (TI) R&D DSP Center. He is the recipient of two student paper awards from SPIE Visual Comm. Image Processing and IEEE Signal Processing & Comm. Applications conferences and holds research fellowship from TI Leadership University Program.