Department of Electrical and Computer Engineering
The Johns Hopkins University

520.643 Digital Multimedia Coding and Processing Course Syllabus

Prof. Trac D. Tran

Spring 2003

Dates	Topics
Jan. 30, 31	Organizational Meeting. Introduction. Motivation. Main Principles.
Feb. 6, 7	Inner Product. Norm. Orthogonality. Z-transform. Discrete-Time Signals and Systems. Digital Filters. Sampling.
Feb. 13, 14	Information Measures. Lossless Coding Techniques. Entropy Coding. Huffman and Arithmetic Coding.
Feb. 20, 21	Predictive Coding. Quantization. Quantization Noise Model. Optimal Conditions. Quantizer Design. Vector Quantization.
Feb. 27, 28	Multirate System Fundamentals. Downsampling. Upsampling. Polyphase. Filter Banks. Time-Frequency Tiling. Transforms. Basis Functions. DFT. FFT.
Mar. 6, 7	Coding Gain. Energy Compaction. Optimal Transform: KLT. Exam #1.
Mar. 20, 21	DCT. Fast and Efficient DCT Implementations. Lapped Transform.
Mar. 27, 28	Wavelet Transform. Wavelet Packet. Best Basis.
Apr. 3, 4	Audio Coding Standards. MP3. AC3. AAC. Image Compression Standards. JPEG. Project Proposals Due.
Apr. 10, 11	Zerotree Coding. Embedded Coding. JPEG2000.
Apr. 17, 18	Motion Estimation and Compensation. Video Coding Standards. MPEG. H.263.
Apr. 24, 25	Advanced Digital Multimedia Processing Techniques. Multimedia Processing in the Compressed Domain. Transcoding. Packet video. Communication and Networking Issues.
May 1, 2	Exam #2. Project Demo/Presentations.
May 9	Project Reports Due.