1003-94-1142   **Diego Dugatkin** and **Hao-Min Zhou*** (`hmzhou@math.gatech.edu`), School of Mathematics, Georgia Tech, Atlanta, GA 30332, and **Tony F. Chan** and **Michelle Effros**. *Lagrangian Optimization of a Group Testing for ENO Wavelet Algorithms in Image Compression.*

In this talk, we consider the generalization of multi-resolution optimization techniques to the Group Testing for Wavelets (GTW) image compression algorithms, incorporating the adaptive Essentially Non-Oscillatory (ENO) wavelet coefficients in the optimization procedures. While retaining most of the advantages of standard wavelet transforms, such as multi-resolution decomposition, fast transform algorithms and efficient energy compaction, the adaptive ENO wavelet transforms reduce the ringing effects of image edges in the reconstruction by modifying the standard wavelet coefficients near discontinuities. By combining the ENO wavelet transforms with the GTW image compression quantizer, and by introducing a Lagrangian function based on rate and distortion measurements, we develop a principled technique to optimize the ENO wavelet coefficient approximations, and the multiresolution code performance relative to a user-defined priorities according to the Lagrangian function. At the resolutions of highest interest, the resulting algorithm achieves gains of approximately 0.7 dB over the standard GTW algorithms. (Received October 04, 2004)