New Course, Fall 2010

Algorithms for Spectral Imaging and Sensing
(ECE595-008; MW 9:30 – 10:45)

Topics:
- Fundamentals of multispectral and hyperspectral sensing and imaging: technologies and applications, including spectral image acquisition in the MICA lab at CHTM (UNM).
- Multi-sensor data fusion and spatio-spectral resolution enhancement
- Algebraic and statistical methods for feature extraction and data reduction
- Spectral unmixing of hyperspectral data and abundance estimation
- Nonuniformity correction for thermal and spectral imagers
- Anomaly detection
- Multispectral recognition: material detection and identification
- Multispectral image edge-detection and segmentation
- Signal processing for polarization imagers
- 3D integral imaging

Recommended background:
Knowledge of pattern recognition and image processing (e.g., ECE517 and ECE533),

Course information and requirements:
- Weekly paper reading and presentations
- Weekly discussions of papers presented (alternate periods with the presentations)
- Projects on a subset of the covered topics (hyperspectral and multispectral data are available)
- Instructor: Professor Majeed Hayat (hayat@ece.unm.edu)