

## Distinguished Lecture Series

**Melba Crawford**

*Associate Dean of Engineering for Research, Purdue University*

April 8, 2016  
 5:00 pm

# *Hyperspectral Remotely Sensed Data: Opportunities and Challenges*



Hyperspectral data provide new opportunities for exploiting chemistry specific features to characterize targets, perform atmospheric correction, cross calibrate sensors, and accomplish improved land cover mapping. Significant challenges remain due to correlated spectral bands, high dimensionality, and nonlinear spectral responses, as well as the quantity of data that is generated. Advanced methods in machine learning, including nonlinear feature extraction and active learning, are promising for analysis of hyperspectral data. Nonlinear manifold learning methods provide natural capability to both accommodate nonlinear scattering and practical, robust feature extraction methods in dynamic environments. Active learning techniques, that focus on developing informative training sets with minimal redundancy, promote greater exploitation of the information in both labeled and unlabeled data, while significantly reducing the cost of data collection. New developments for feature extraction via global and local manifold learning and strategies for active learning for classification and unmixing of hyperspectral data are presented, and the impact is demonstrated using testbed hyperspectral data from airborne platforms and the NASA Hyperion sensor.

Melba Crawford is a Professor of Engineering and Agriculture at Purdue University, where she is Director of the Laboratory for Applications of Remote Sensing and the Chair of Excellence in Earth Observation. She also serves as the Associate Dean for Research of the College of Engineering. Previously, she was a faculty member at the University of Texas at Austin, where she founded an interdisciplinary research and applications development program in space-based and airborne remote sensing. Dr. Crawford received the B.S. and M.S. degrees in Civil Engineering from the University of Illinois, Urbana, and the Ph.D. degree in Systems Engineering from Ohio State University, Columbus.

### AGENDA

- Tour Center of Geospatial Analysis 4pm
- Reception 5pm
- Lecture 6pm

