# Upcoming Events

**April 14, 2011**
**ADMI 2011**
Clemson University
Clemson, South Carolina
http://www.admiusa.org/admi2011/

**April 27, 2011**
**Undergraduate Research Symposium**
University of New Hampshire
http://www.unh.edu/urc/

**May 23 – July 15, 2011**
**Undergraduate Research Experience in Ocean and Marine and Polar Science**
Elizabeth City State University
http://nia.ecsu.edu/ure.pdf

**July 18 - 21, 2011**
**TeraGrid '11 Conference**
Salt Lake City, Utah
https://www.teragrid.org/web/events/tg11/

# CERSER
## http://cerser.ecsu.edu

The goal of the ECSU Center of Excellence in Remote Sensing Education and Research (CERSER) is to develop and implement innovative and relevant research collaborations focused on ice sheet, coastal, ocean, and marine research. CERSER is also the home of the IEEE-Geoscience and Remote Sensing Society Eastern North Carolina Chapter #03181 and IEEE-GRSS Student Chapter Branch #66221.

GEOSCIENCE AND REMOTE SENSING SOCIETY

## Distinguished Lecture Series

# Dr. Terrance West
U. S. Army Aviation and Missile
Research Development and Engineering Center

## March 29, 2011

### RAPID DETECTION OF AGRICULTURAL FOOD CROP CONTAMINATION VIA HYPERSPECTRAL REMOTE SENSING

Meeting of the Eastern North Carolina IEEE-GRSS Chapter #03181

ECSU   GRSS

# IEEE-GRSS Distinguished Lecturer

## Dr. Terrance West

Terrance West holds a B.S in electrical and computer engineering, a MS and PhD in electrical engineering from Mississippi State University. He is a native of Meridian, Mississippi and is the first in his family to earn a college degree. In 2007 he was supported by the IEEE-GRSS minority travel program for his oral presentation titled "Multiclassifiers and Decision Fusion in the Wavelet Domain for Exploitation of Hyperspectral Data." The conference was held in Barcelona, Spain. He is currently an engineer with the U. S. Army Aviation and Missile Research Development and Engineering Center (AMRDEC).

### *Rapid Detection of Agricultural Food Crop Contamination via Hyperspectral Remote Sensing*

### Abstract

Multispectral and hyperspectral imagers are powerful tools in remote sensing and provide great promise for rapid detection and characterization of agricultural food crop contaminants. Hyperspectral imagers can be useful in detecting when a contaminant has been introduced to an agricultural crop before the crop stresses are visible to the human eye, providing a valuable lead time in first response. In some cases there is no visible indicator that the contaminant has been introduced to the vegetation; i.e. the optical reflectance is altered only in the non-visible regions of the optical spectrum. A hyperspectral image can provide densely sampled reflectance measurements across the visible and near infrared regions of the spectrum, resulting in hyperspectral signatures with 100's of spectral bands. These signatures can then be analyzed with advanced mathematical algorithms, to determine if a particular target is present. In this application, the "target" would be "a contaminated agricultural crop" and the "nontarget" would be "an agricultural crop under normal conditions".

In this work we investigate the use of discrete wavelet transforms, multi-classifiers, and decision fusion in an automated target recognition (ATR) system to address the challenges of hyperspectral data as it relates to food crop contamination detection. The experimental results are very promising, resulting in accuracies as high as 90+% for some cases, and demonstrate the efficacy of the proposed system for rapid detection of agricultural food crop contaminations.

## Schedule of Activities

Tuesday, March 29, 2011 :: Room 229 :: Dixon Hall :: ECSU

☙ 1:30pm..............................................................................**Registration**

☙ 2:00pm Welcome and Introductions .............................**Dr. Linda Hayden**
GRSS Chapter President

**Dr. Henry Bass**
Dean, ECSU School of Mathematics, Science and Technology

**IEEE-GRSS Distinguished Lecture Series**
Introduction .............................................................Mr. Kuchumbi Hayden

## Dr. Terrance West

### *Rapid Detection of Agricultural Food Crop Contamination via Hyperspectral Remote Sensing*

☙ 3pm ...........................................................................................**Reception**

☙ 3:30pm.................**Meeting of the Geoscience and Remote Sensing Society**

**Minutes – October 2010 Meeting**

**Vice-President Report**

**Reports**
- IGARSS '11............................................................. Dr. Linda Hayden
- Cloud Computing Conference .......................Nadirah Cogbill, Jeff Wood
- BEYA ......................................................................................Report

**Closing Remarks...................................................Dr. Charles Luther**
GRSS Past President