

Workshops

Workshop 10

Hyperspectral Image Processing and Feature Extraction: Maximizing Geospatial Information Retrieval

William Farrand, *Space Science Institute*
Stuart Blundell, *Visual Learning Systems, Inc.*

8:00 am to 5:00 pm, CEU .8

Room 8

INTERMEDIATE Workshop: Intended for users of remote sensing data including analysts who may have used multispectral data and GIS systems and are now interested in using hyperspectral data and feature extraction in their work. Also appropriate for managers who must make decisions about what kind of remote sensing data to purchase for their projects and/or what kind of image processing or feature extraction software that they should purchase.

Imaging spectrometry, commonly referred to as hyperspectral remote sensing, provides high-resolution spectral information for environmental and natural resource projects. Hyperspectral image processing approaches can also be applied to broadband multispectral imagery and results from these analyses can be used to enhance automated feature extraction techniques. In this workshop, we will provide students with an introduction to imaging spectrometry, hyperspectral image processing techniques, and automated feature extraction to demonstrate how results obtained from digital imagery can add value to maintenance of geospatial databases. Hyperspectral data requires a substantially different processing approach from that required for multispectral data; however, such an approach can add value to information extraction from broadband multispectral data. We will emphasize that the added value in imaging spectrometry is on the spectrometry, the ability to identify materials based on their reflectance signatures. We will briefly discuss the phenomenology of reflectance spectrometry and explain why some materials are more amenable to mapping than others. We will describe commercially available processing systems that are available for processing hyperspectral and multispectral data and discuss the processing techniques within those packages. Certain processing techniques are better suited to certain applications. We will explain why this is so. We will also discuss some of the advantages and shortcomings of current airborne and orbital hyperspectral systems as well as planned systems.

The student will be introduced to the concepts of developing feature extraction models for automated feature extraction using hyperspectral, Lidar, DEMs and multispectral data within a GIS. We will provide real-world examples of how end products, derived from hyperspectral and multispectral data processing, including resultant mineral and vegetation species maps, can be incorporated into the Feature Analyst for feature extraction in a GIS. The desired final result is a map that will be of immediate utility to the end user.

We will provide a package of materials to the students that will include hard copies of the material presented and an extensive list of references on the topics addressed. We will engage the class with an in-class exercise and several "take-home" hands-on exercises.

Workshop 11

Preparing For ASPRS Certification

Robert Burtch, Professor, *Ferris State University*

8:00 am to 5:00 pm, CEU .8

Room 9

INTERMEDIATE Workshop: Assumes participants have subject knowledge and are serious about taking the Certification Exam.

The purpose of this workshop is to prepare individuals who are planning to sit for the ASPRS Certification exams as a Certified Photogrammetrist or Certified Mapping Scientist in either Remote Sensing or GIS. The workshop will begin by explaining the purpose and form of the exam. It will then identify key topical areas that an applicant should be aware of prior to taking the exam. Topics will start with a review of the basic concepts and sample questions to show how they will be tested for on the exam. Finally, the workshop will try to identify resources in which exam takers should be aware of and study from in their preparation for the examination.

Workshop 12

Airborne GPS and Inertia in Support of Triangulation and Orientation of Airborne Framing and Push broom Sensors

Qassim A. Abdullah, Chief Scientist, *EarthData International of Maryland*
Riadh Munjy, Professor of Surveying and Civil Engineering, *California State University, Fresno*

Mushtaq Hussain, Professor of Surveying and Civil Engineering,
California State University, Fresno

8:00 am to 5:00 pm, CEU .8

Room 11

INTERMEDIATE Workshop: In order to maximize the benefits of this course, participants should have some knowledge or previous experience with aerial triangulation and the use of ABGPS/IMU to orient airborne sensors. In addition, a good understanding of photogrammetric and mapping accuracy standards are suggested.

The workshop will provide the participants with good understanding of the new concept of controlling the camera position with a differential carrier phase GPS receiver and an Inertial Measurement Units (IMU) to dramatically reduce the amount of ground control required for conventional aerial triangulation. In addition, the workshop will discuss the principal of push broom digital imaging and methods of triangulating the newly utilized framing digital and push broom sensors. The workshop will also present design concepts, practical results, and strengths and shortcomings of the technology. Participants, at the end of the workshop, are expected to have enough understanding to enable them to evaluate, design, and/or execute an airborne GPS-controlled aerial-triangulation mission.

Workshop 13

Emerging Technologies in Photogrammetry and Remote Sensing

Mike Renslow, *Renslow Mapping Services*
Claire Kiedrowski, *KAPPA Mapping, Inc.*

8:00 am to 5:00 pm, CEU .8

Room 12

INTERMEDIATE Workshop: This workshop provides an overview of emerging technologies and their impact on photogrammetry and remote sensing methodologies. The advance towards full digital mapping from start to finish, and the capacity to capture very large amounts of data supported by rapid processing and software will alter the way maps and imagery are produced in the near future. At

the same time, active sensors, hand-held data collection devices, and feature extraction are changing fundamental mapping procedures and the way data is supplied to GIS.

Participants will receive an overview of the systems, technologies, and impacts on mapping in the next two to three years, as well as, the institutional issues involved in implementation.

Workshop 14

Looking Above the Terrain Model: Lidar for Vegetation Assessment

Sorin C. Popescu, *Texas A&M University*

8:00 am to 12:00 noon, CEU .4

Room 10

INTERMEDIATE Workshop: The participants are expected to have a basic understanding of remote sensing techniques and image processing.

The overall goal of this workshop is to introduce participants to lidar processing techniques and applications for deriving information on forest resources and canopy parameters. More specific objectives are to: (1) briefly familiarize participants with basic lidar and laser ranging concepts; (2) introduce types of lidar sensors for forest resources assessment and the Las Lidar data format; (3) review algorithms for deriving information on forest resources; (4) review processing techniques for generating canopy height models and "multi-band" Lidar height bins, (5) introduce participants to TreeVaW, a Lidar processing software for identifying and measuring individual trees on Lidar-derived canopy height models, and (6) discuss an array of processing techniques derived from multi- and hyper-spectral image processing for using Lidar-derived data products for assessing vegetation parameters.

Workshop 15

Assessing the Accuracy of GIS Information Created from Remotely Sensed Data: Principles and Practices

Kass Green, President, *Alta Vista*

Russell G. Congalton, *University of New Hampshire*

1:00 pm to 5:00 pm, CEU .4

Room 10

INTERMEDIATE Workshop: In order to maximize the benefits of this course, participants should have previous experience with GIS and remotely sensed data. In addition, a good understanding of statistical principles is also strongly suggested.

This course focuses on the principles, techniques, and practical aspects of assessing the accuracy of GIS information derived from remotely sensed data. Participants will receive instruction in how to design accuracy assessment procedures, allocate accuracy assessment samples, collect both field and photo reference data, and analyze accuracy assessment results. While spatial accuracy is addressed, the course primarily focuses on methods and analysis for thematic accuracy assessment. Examples of accuracy assessment case studies based on actual project data will be presented and discussed. Each participant in this course will come away with a solid understanding of accuracy assessment procedures for spatial data, and the knowledge to properly interpret the results of such procedures.

ASPRS Committee Meetings

Journal Policy and Publications Committees

8:00 am to 10:00 am

Room 1

Photogrammetric Applications Division (PAD)

10:00 am to 12 noon

Room 1

Primary Data Acquisition Division (PDAD)

10:00 am to 12 noon

Room 4

Membership Committee

10:00 am to 12 noon

Room 2

Photogrammetric Applications Division (PAD)

Lidar Subcommittee

1:00 pm to 3:00 pm

Room 13

Photogrammetric Applications Division (PAD)

Softcopy Subcommittee

1:00 pm to 3:00 pm

Room 4

Transportation Surveys Subcommittee

1:00 pm to 5:00 pm

Room 1

Region Membership Officers' Training

2:00 pm to 5:00 pm

Room 2

Data Preservation and Archiving Committee

3:00 pm to 4:00 pm

Room 4

Remote Sensing Application Division (RSAD) and Geographic Information Systems Division (GIS)

4:00 pm to 6:00 pm

Room 4

By-Laws Committee

5:00 pm to 6:00 pm

Bayshore Ballroom

Division Directors

5:00 pm to 6:00 pm

Greco Ballroom

User Groups

GeoCue

8:00 am to 12:00 noon

Room 5

GeoCue Corporation will host its annual North American user's group meeting at the 2007 ASPRS Conference in Tampa, FL. We will be presenting our latest GeoCue process management solutions as well as soliciting user feedback on features needed for future versions. GeoCue Corporation is a software development and consulting services company specializing in geospatial production management solutions. Our products provide an integrated end-to-end processing framework that, when combined with industry leading production tools, significantly reduces production time from data acquisition to finished product.

ENVI

8:00 am to 12:00 noon

Room 7

ITT Visual Information Solutions invites you to the ENVI User Group Meeting. If you're an ENVI user or would like to learn about ENVI's