ASPRS Webinar Series

Hyperspectral Remote Sensing: Phenomenology and Data Processing

Presenter
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Imaging spectrometry, commonly referred to as hyperspectral remote sensing, provides high-resolution spectral information for environmental, natural resources, and urban characterization projects. In this webinar, students will be provided with an introduction to the phenomenology of imaging spectrometry, a discussion of hyperspectral sensors and data types, and some hyperspectral image processing techniques. An emphasis will be placed on the fact that the added value in imaging spectrometry is on the *spectrometry*, the ability to identify materials based on their reflectance signatures. In addressing the phenomenology of hyperspectral remote sensing, its basis in reflectance spectrometry will be discussed and an explanation will be provided as to why some materials are more amenable to mapping than others. Commercially available data processing packages that are available for processing hyperspectral and multispectral data will be discussed as well as a discussion of the processing approaches within those packages. Certain processing techniques are better suited to certain applications and the reasons for this are addressed. Also some discussion will be provided with regards to the advantages and shortcomings of current airborne and orbital hyperspectral systems as well as planned systems.

Topics to be addressed

I. Define imaging spectrometry (hyperspectral remote sensing)
II. The phenomenology of reflectance spectrometry
III. Commercially available hyperspectral imaging (HSI) software packages
IV. HSI processing techniques and approaches
V. Hyperspectral sensor system architectures
VI. Descriptions of available and soon-to-be available hyperspectral systems
VII. Summary and final discussion

Who Should Participate

This half day webinar is intended for users of remote sensing data. This includes analysts who may have used multispectral data or some other form of remote sensing data and are now interested in using hyperspectral data in their work. This webinar is 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 multi- or hyperspectral image processing software that they should purchase. This workshop will provide an introduction to the power of hyperspectral data in remote sensing projects.

About the Presenter

Dr. William Farrand is geoscientist with over 20 years of experience working with multispectral and hyperspectral remote sensing data. He received a PhD in the Geosciences with a minor in Remote Sensing from the University of Arizona in 1991. Dr. Farrand worked from 1992 to 1995 for Science Applications International Corporation under contract to work on the Hyperspectral Digital Imagery Collection Experiment (HYDICE) program. In the late ‘90s, Dr. Farrand worked on various commercial remote sensing projects including an association with Earth Search Sciences and applications of data from their Probe-1 hyperspectral sensor. Dr. Farrand was also involved in a 1997 Department of Energy remote sensing mission over the National Nuclear Center of Kazakstan. In the 2000’s, Dr. Farrand has worked on several different NASA-funded planetary remote sensing projects. Since 2002, he has been a science team member on the Mars Exploration Rover mission and has been a lead scientist on interpreting multispectral data returned from the Pancam instruments on-board the Spirit and Opportunity rovers. Dr. Farrand has also worked with hyperspectral data returned by the Compact Reconnaissance Imaging Spectrometer for Mars (CRISM) on-board the Mars Reconnaissance Orbiter.