Hyperspectral Imaging (HSI) Remote Sensing Course
at George Mason University, Fall 2018

GGS 840–001, CRN 81742: "Hyperspectral Imaging Applications"

Spring Semester, Credit Hours: 3

Description: This course will provide the requisite information to understand advanced hyperspectral imaging (HSI) technology and HSI remote sensing applications concepts. We will cover many applications of HSI. An emphasis is placed on the underlying scientific principles and the application of the technology to real world problems. Topics that will be covered include advanced hyperspectral analysis algorithms and methods, sensing system tradeoffs, data collection and processing, quantitative remote sensing techniques, data fusion (e.g., imaging radar, lidar and HSI), and case studies. The quantitative remote sensing techniques will include literal and non-literal information extraction methods. Applications and case studies will be on topics in environmental monitoring, agriculture and forestry, homeland security, disaster/emergency response, geology, the littoral zone, and others. Ground, airborne, and spaceborne multi-sensor remote sensing systems will be covered.

Course Objective: To provide students with an introduction to modern advanced hyperspectral imaging (HSI) remote sensing applications and the fundamental physical principles involved in the application of HSI technology. The course will prepare the student to: (1) undertake graduate research in hyperspectral and multi-sensor literal and non-literal data analysis; (2) prepare the student to participate in professional activities in HSI technology; (3) broaden the student's background in the general field of quantitative spectral remote sensing with an emphasis on applications; and (4) prepare the student to discover and adapt applications of HSI technology to areas of interest to end users of remote sensing data products.

Prerequisites: An introductory course in remote sensing or digital image processing; other academic or industrial/professional experience in remote sensing; or permission of instructor.

Required Materials: Student license of the ENVI® software package; see: https://www.harrisgeospatial.com/IndustrySolutions/Academic.aspx#students

Textbook: *Hyperspectral Imaging Remote Sensing: Physics, Sensors, and Algorithms* by Manolakis, Lockwook, and Cooley, Cambridge University Press, 1st ed., 2016, ISBN-13: 978-1107083660. We'll use the book more as a reference than as a chapter-by-chapter regimen.

Grading: Midterm Exam: 25% • Final Exam: 25% • Project: 25% • Assignments: 25%

Instructor: Dr. Ronald (Ron) G. Resmini
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Class: Fairfax campus, Exploratory Hall, room 2312, Wednesdays, 4:30 p.m. to 7:10 p.m.
   First day of class: 29th of August and last day of class: 5th of December, 2018.