

Hyperspectral Image Analysis with Applications of UAVs for Precision Agriculture

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Hyperspectral sensors inherently acquire high dimensional optical data resulting from fine spectral sampling. In recent years, smaller, lighter, and more affordable hyperspectral sensors have been developed, allowing them to be utilized on a variety of platforms, including unmanned aerial vehicles (UAVs or drones). As a result, hyperspectral data are now more often high dimensional not only spectrally, but also spatially and temporally. This seminar will provide a broad overview of techniques commonly employed for analysis of high dimensional data (such as linear transform-based approaches and data partitioning methods) as well as more specialized techniques designed for hyperspectral imagery (spectral band grouping, multi-classifier and decision fusion, and game theory approaches). The seminar will also include examples of applying such methods to hyperspectral imagery for precision agriculture applications, including vegetative species mapping and vegetative stress characterization. Practical details will also be provided regarding the field campaigns and UAV image collection for these studies.



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Lori Mann Bruce, Ph.D. is a Giles Distinguished Professor of electrical and computer engineering and the Associate Vice President for Academic Affairs and Dean of the Graduate School at Mississippi State University. As Dean of the Graduate School at a Research, Land Grant institution, Dr. Bruce is responsible for providing leadership and academic oversight for the approximately 4000 graduate and professional students enrolled in more than 150 graduate programs. Dr. Bruce serves as an advocate for graduate education at the university level and provides leadership to graduate enrollment management, academic curricula, academic policies and procedures, assistantship and fellowship programs, and professional development programs.

Prior to her current position, Dr. Bruce has served as Associate Dean for Research and Graduate Studies in the Bagley College of Engineering, Director of the Raspet Flight Research Center, Associate Director of the Geosystems Research Institute, and Professor of Electrical and Computer Engineering. As a faculty member, her graduate teaching and research endeavors have been focused on hyperspectral remote sensing. She has served as the Principal Investigator or Co-PI on more than 20 funded research grants and contracts, totaling approximately \$20 million from federal agencies. As a faculty member, she has taught 45 sections of 17 different engineering courses and has successfully advised, as major professor or thesis/dissertation committee member, 75 Ph.D. and Master's students. Her research has resulted in over 130 refereed publications. Her research in remote sensing for agricultural and environmental applications has been presented to audiences across the US and in 15 countries.