Engs 673: Advanced Digital Image Processing
School of Engineering

This course teaches students advanced concepts in digital image processing, with explanations and examples that demonstrate how the topics can be applied to remotely sensed images. The course begins with a review of resolution, including spatial, spectral, temporal, and radiometric resolutions. Then the student has the option to choose between the next two modules; discrete image transforms and image quality metrics. The coverage of discrete image transforms includes theory and examples of sinusoidal, rectangular-waveform, eigen-based, and wavelet transforms. The unit on image quality metrics includes information about manual ratings, mean-square-error, signal-to-noise ratios, etc. After these two modules are completed, the student has the option of three more modules: image enhancement and restoration, image compression, and automated image analysis. For image enhancement, the student is introduced to noise models, as well as various spatial and spectral filters for noise removal. The image compression module introduces the student to transform-based compression schemes, with examples of lossy and lossless schemes. Finally, the automated image analysis module introduces the theory and practical application of 1) segmentation methods, including windowing, thresholding, edge detection, and morphological processing; 2) feature extraction methods, such as shape and texture features; and 3) feature reduction and optimization methods.

3 Credits

Prerequisites

- Engs 624: Introduction to Digital Image Processing $target.descriptions.MinimumGrade$

Instruction Type(s)

- Indiv Based: Individual Based for Engs 673
- Indiv Based: Online Program for Engs 673

Subject Areas

- Engineering, Other