SYSE 512

SYSTEMS SENSING & IMAGING ANALYSIS

Offered Spring of even years

Prereqs: STAT301 or equivalent

DESCRIPTION

Sensing, sampling, filtering, transducing, transmitting, and analyzing signals and images in engineering systems. Skills for ingesting information from the real (physical) world in all its messy details to the cyber world.

BENEFITS

The ability to apply technologies in sensing and sensing systems, filtering operations, and sensory data transformation techniques to applications such as authentication, inspection, biometrics, and pattern recognition. Color science, a newly-refreshed field due to additive and custom manufacturing, is applied to signal and image processing. Classification and evaluation of images, including hyperspectral images, is provided. Applications to fields such as manufacturing, energy, agriculture, transportation, and supply chains/logistics are provided.

COURSE OBJECTIVES

Topics include:

- Major processes in sensing and sensing systems
- Filtering operations on signals and images
- Thresholding, enhancement, restoration and transformation techniques to images in applications such as authentication, inspection, biometrics, and pattern recognition
- Color science techniques to images and video
- 1D signal and 2D image analysis and feature identification approaches
- Signal and image analysis using classification and continuity techniques
- Hyperspectral images for robust image understanding
- Determining the presence of fraudulent imaging

SYSTEMS ENGINEERING
COLORADO STATE UNIVERSITY