EE866 Multisensor Integration for Intelligent Systems
Autumn 2011
http://www2.ece.ohio-state.edu/~zheng/ece866
Instructor: Yuan F. Zheng
Classroom: 0314 BO
Lecture hour: 1:30 pm – 2:18 pm, MWF
Office hour: 12:30 pm– 1:30 pm, MWF

1. Prerequisites by Topic
   a. Fundamental of probability and statistics
   b. Principle of computer operating systems
   c. Fourier transform
   d. Ability to use a high-level language such as MatLab or LabView.

2. References


3. Course Objectives

This course is to cover topics in multi-sensor fusion both conventional and modern, which include a. physical sensing devices, b. mechanisms for multi-sensor data fusion, c. statistical decision making, d. wavelet transform for data fusion, e. compressive sensing, f. particle filtering for object tracking, and g. computer system organization for multi-sensor integration. The course also trains student oral presentation skill.

4. Topics with Typical # of Lectures (total 30 lectures of 48 minutes)

   a. Introduction (1 lecture)

   b. Physical sensors and interface (1 lecture)

   c. Conventional multisensor data fusion approaches (10 lectures)
      - Statistical data fusion – using distance matrix
      - Bayes estimation fusion approach
      - Dempster-Shafer theory

   d. Wavelet transform for image processing (8 lectures)

   e. Particle filtering approach for object tracking (2 lectures)

   f. Compressive sensing (3 lectures)

   e. Student presentations on examples of multi-sensor integration (2 lectures)

   f. Test (2 lectures)

Note: the schedule and topics may vary.

5. Assessments

   a. Homework assignments
   b. Computer-based design project
   c. Mid-term exams
   d. Oral presentation evaluated by both instructor and fellow students

e. Final exam

6. Grading policy

a. Homework (20%)
b. Design project (10%)
c. Two mid-term exams (15% each)
d. Oral presentation (10%)
e. Final exam (30%)