EEE 178: Introduction to Machine Vision
Course Syllabus - Spring 2020

Instructor: Fethi Belkhouche
Office: Riverside Hall 5028
E-mail: belkhouf@ecs.csus.edu
Phone: 8-7346
Meeting Time: Tuesday & Thursday 3:00-4:15pm
Meeting Place: EUR 113
Office Hours: Tuesday 12:00-1:00pm, Wednesday 3:00-4:00pm

Reading:
• Richard Szeliski, Computer Vision: Algorithms and Applications
• Carsten Steger, Markus Ulrich and Christian Wiedemann, Machine Vision Algorithms and Applications
• Linda G. Shapiro and George C. Stockman, Computer Vision.

COURSE DESCRIPTION FROM CATALOG
Fundamental digital image processing and machine vision concepts and their application to the fields of robotics and automation. Topics include: digital image processing, image formation, two dimensional transforms, boundary descriptors, motion, camera calibration, vision for robot control, 3-D vision, and hardware architectures to support vision. Units: 3.0
Prerequisite: EEE 180 or equivalent, or instructor permission.

LEARNING OUTCOMES
After successfully completing the course, students will be able to:
• Perform transformations and filtering operations in the time and frequency domains to achieve desired outputs such as edge detection, noise removal, line and corner detection, and image smoothing.
• Use advanced algorithms such as artificial neural networks for object recognition and classification.
• Perform camera calibration and use stereo vision techniques for 3D applications
• Use contemporary numerical and simulation tools to implement methods and algorithms
• Communicate effectively in written and oral forms.

GRADING POLICY
Student performance in this course is evaluated based on homework assignments, exams and a semester–long project, weighted as follows:
• Homework: 15%
• Exam 1 (Take home part): 15%
• Exam 1 (In-class part): 15%
• Exam 2 (Take home part): 15%
• Exam 2 (In-class part): 15%
• Project: 25%

HOMEWORK
Homework is to be done individually. However, discussions about the homework between students are allowed and encouraged. Some homework problems require the use of Matlab or other numerical tools. Homework is assigned weekly and due in one week. Late homework will be returned without a grade.
PROJECT

The completion of a semester–long project is an important part of this course. Students are required to submit a written report and make a presentation at the end of the semester. Students are encouraged to choose their project and will work in groups of two to complete the project. Groups of three are allowed for more challenging projects.

EXAMS AND LETTER GRADES

There will be two midterm exams and a final exam. Schedule will be announced in class. The final exam is comprehensive. Make-up exams will not be given except in extraordinary circumstances. Letter grade ranges are:

- **A**: \( A \geq 94; 90 \leq A− < 94 \)
- **B**: \( 87 \leq B+ < 90; 83 \leq B < 87; 80 \leq B− < 83 \)
- **C**: \( 77 \leq C+ < 80; 73 \leq C < 77; 70 \leq C− < 73 \)
- **D**: \( 67 \leq D+ < 70; 63 \leq D < 67; 60 \leq D− < 63 \)
- **F**: Below 60