

CMPE573 – Computer Vision

Department:

Computer Engineering

Program Name:

Computer Engineering

Program Code: 25**Course Number:**

CMPE573

Credits:

3 Cr

Year/Semester:

2019-2020 Spring

 Required Course Elective Course Service Course**Prerequisite(s):****Catalog Description:**

Introduction to computer vision, the goal of computer vision, applications of computer vision, special effects such as shape capture, motion capture and camera tracking, difficulties of computer vision, image formation, filtering, edge detection, feature detection and matching, segmentation, feature-based alignment, structure from motion, image stitching, computational photography.

Course Web Page:<https://staff.emu.edu.tr/onsentoygar/en/teaching/cmpe573>**Textbook:**

Richard Szeliski, Computer Vision: Algorithms and Applications, Springer, 2010.

Topics Covered and Class Schedule:**(3 hours of lectures per week)**

- week 1** Introduction to computer vision, the goal of computer vision
- weeks 2-3** Applications of computer vision, special effects such as shape capture, motion capture and camera tracking
- weeks 4-5** Difficulties of computer vision, image formation, filtering
- weeks 6-7** Edge detection, feature detection and matching, segmentation, feature-based alignment on computer vision applications
- weeks 8-9** (Midterm Exams)
- week 10** Structure from motion
- week 11** Image stitching
- week 12** Computational photography
- week 13-15** Project Presentations
- weeks 16-18** (Final Exams)

Course Learning Outcomes:

On successful completion of the course, the student is expected to be able to:

- (1) Understand the basics of computer vision
- (2) Learn the applications of computer vision and special effects such as shape capture, motion capture and camera tracking.
- (3) Learn the difficulties of computer vision, image formation, filtering
- (4) Develop skills in the concepts of edge detection, feature detection and matching, segmentation, feature-based alignment on computer vision applications
- (5) Learn structure from motion, image stitching, computational photography
- (6) Develop skills in performing an individual research project on recent developments in one of the major topics related with the course
- (7) Develop skills in reading journal papers and understanding the topic for the project
- (8) Gain ability in preparing a research project and presenting the project in front of other students and instructors
- (9) Gain ability to implement/compare different methods in a computer vision system

	Method	No	Percentage
Assessment	Midterm Exam(s)	1	30%
	Final Examination	1	40%
	Term Project	1	15% (Part1: 7%, Part2: 8%)
	Assignments	2-4	10%
	Attendance	-	5%

Contribution of Course to Criterion 5

Credit Hours for:

Mathematics & Basic Science : 0

Engineering Sciences and Design : 4

General Education : 0

Relationship of Course to Program Outcomes

The course has been designed to contribute to the following program outcomes:

- a) apply knowledge of mathematics, science, and engineering,
- e) identify, formulate, and solve engineering problems,
- k) use the techniques, skills, and modern engineering tools necessary for engineering practice,
- l) an ability to apply knowledge of probability and statistics, mathematics through differential and integral calculus, discrete mathematics, basic sciences, and computer science

Notes and Policies**Exams:**

- If you miss midterm or final exam and submit a written report to your instructor stating your excuse within 3 days of that examination, you will be able to enter makeup exam at the end of the semester.
- If you miss both midterm and final exams and do not submit any written report, you will get an “NG” grade. In that case, if you submit report for both missed exams, you will be able to enter makeup exam for one of the missed exams.

PLAGIARISM

- Plagiarism (which also includes any kind of cheating in exams, assignments, and lab works) is a disciplinary offence and will be dealt with accordingly. Furthermore, the penalty of plagiarism is to get grade zero for the corresponding exam, assignment, or lab work.

IMPORTANT REMARKS

- You should have regular attendance to the lectures for being successful in the course.

Course related materials will be published on the course web site and you will be responsible from all. Note that the course web site will be updated during the semester. Therefore, please check it regularly.

Prepared by: Assoc.Prof.Dr. Önsen Toygar

Date Prepared: 17 February, 2020