Course Syllabus

Course Title: EE569 Introduction to Digital Image Processing
Units: 4
Lecture Time: 2021 Spring, Monday and Wednesday 8-9:50am
Lecture Location: Online Instruction
Discussion Time: Friday 10-10:50am
Discussion Location: Online Instruction

Instructor: Prof. C.-C. Jay Kuo
Office: Ming Hsieh Dept. of Electrical Engineering, Room EEB 440
Office Hours: Monday and Wednesday: 10-11am via zoom
Zoom Link Information:
https://usc.zoom.us/j/93750640502?pwd=dzlTc0x5dStxZWpNZnVSKy9YV0hlQT09
Meeting ID: 937 5064 0502
Passcode: 450551
Contact Info: E-mail: cckuo@sipi.usc.edu, Tel: (213) 740-4658

Website: https://courses.uscden.net/d2l/login
1. Check the website for latest announcements and project assignments.
2. For general questions, please utilize the discussion board on Piazza. Sign up link at https://piazza.com/usc/spring2021/ee569 . TAs will check the forum on a daily basis.

Teaching Assistants:
- Zohreh Azizi (zazizi@usc.edu)
- Zhiruo Zhou (zhiruozh@usc.edu)
- Yao Zhu (yaozhu@usc.edu)
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TA Office Hours:
- Monday 4:30-6PM (Zohreh)
- Tuesday 2:20-3:50PM (Zhiruo)
- Tuesday 5-6:30PM (Yao)
- Wednesday 4:30-6PM (Zohreh)
- Thursday 1:30-3PM (Yao)
- Friday 4:30-6PM (Zhiruo)

Zoom link for TA Office Hours: https://usc.zoom.us/j/94942819167

Grader:
- Ganning Zhao (ganningz@usc.edu)
- Mingze Guo (mingzegu@usc.edu)
- Yung-Chun Chiang (chiangyu@usc.edu)

Graders' office hours by appointment only. Once grades for each assignment are out, graders will announce their office hours to answer grading related questions.

Teaching Objectives

To equip students with fundamental knowledge of theory, algorithms and applications of modern digital image processing techniques and the programming skills for their implementation

Prerequisite/Co-Requisite: None

Recommended Preparation: EE503

Programming Language Requirement:

Use either C/C++ or Matlab to implement the algorithms in your homework. You are encouraged to use C/C++ since it is commonly used in industry.

Midterm Exams:

1st midterm exam: March 1 (Monday) 8-10am.
2nd midterm exam: April 12 (Monday) 8-10am.

Homework and Term Project:

There will be six homework assignments. Each home assignment contains two computer programming projects. All homework assignments will be due on the midnight of the due date (11:59pm) - no late homework will be accepted.
Homework and Term Project Schedule:
Assignment #1: Assigned on January 20 (Wednesday); Due on February 7 (Sunday).
Assignment #2: Assigned on February 8 (Monday); Due on February 23 (Sunday).
Assignment #3: Assigned on February 24 (Wednesday); Due on March 9 (Tuesday).
Assignment #4: Assigned on March 10 (Wednesday); Due on March 28 (Sunday).
Assignment #5: Assigned on March 29 (Monday); Due on April 14 (Wednesday).
Assignment #6: Assigned on April 14 (Wednesday); Due on April 30 (Friday).

Grading Policy:

1. Midterm Exam: 34% (17% each)
2. Homework Assignments: 66% (11% each)
    a. Quality of written report (4% of 11%)
    b. Quality of experimental results (6% of 11%)
    c. Quality of codes plus semester-end oral exam (1% of 11%)
3. Online participation: 5%
    a. Making posts on Piazza. (2% of 5%)
    b. Answer questions on Piazza. (3% of 5%)

Textbook:

William K. Pratt: Digital Image Processing, 4th Edition, John Wiley & Sons Inc., 2007. (ISBN 9780471767770).

Coverage:

Topic #1: Image demosaicing, contrast/histogram manipulation, enhancement and filtering
Topic #2: Image denoising
Topic #3: Edge and boundary detection
Topic #4: Digital halftoning
Topic #5: Geometric image modification and image warping
Topic #6: Morphological processing, shape analysis and retrieval
Topic #7: Texture analysis and segmentation
Topic #8: Salient point detection and image matching
Topic #9: Fundamentals of convolutional neural networks
Topic #10: Successive subspace learning

Homework Coverage:

Homework Assignment #1 (Coverage: Topics #1-2)
Homework Assignment #2 (Coverage: Topics #3-4)
Homework Assignment #3 (Coverage: Topics #5-6)
Homework Assignment #4 (Coverage: Topics #7-8)
Homework Assignment #5 (Coverage: Topics #9)
Homework Assignment #6 (Coverage: Topics #10)

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards: https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity (http://equity.usc.edu) or to the Department of Public Safety (http://adminopsnet.usc.edu/department/department-public-safety). This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men (http://www.usc.edu/student-affairs/cwm/) provides 24/7 confidential support, and the sexual assault resource center webpage (http://sarc.usc.edu) describes reporting options and other resources.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs (http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information (http://emergency.usc.edu) will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.