Tentative Syllabus
CSCE 867 - 001: Computer Vision
(Spring 2021)

Course Instructor: Dr. Yan Tong
Email: tongy@cse.sc.edu
Storey Innovation Center, Rm 2273
777-0801 (office)
Virtual Office Hours: by appointment

Course Meeting Time: Tuesday, Thursday 10:05 am - 11:20 am, Blackboard Collaborate Ultra

Class Homepage: http://www.cse.sc.edu/~tongy/csce867/csce867.html

Academic Bulletin Description:
Scene segmentation using texture, color, motion; representation of 2-D or 3-D structures; knowledge-based vision systems.

Pre-requisites:
CSCE 763 Digital Image Processing and a good background in calculus, linear algebra, statistics, signal processing, programming in C++, Python, or MATLAB

Goals and Learning Outcomes:
This is a graduate-level course. Topics to be covered include: image formation (computational model of camera, radiometry, and camera calibration), early vision on one image (linear filters, edge detection, and features), early vision on multiple images (stereo vision and motion estimation), mid-level vision (segmentation and object tracking), high-level vision, and special topics on applications.

The measurable learning outcomes used to determine the degree to which this goal is being met are as follows:

- Students will achieve the necessary knowledge to solve various practical computer-vision problems
- Students will build a solid background for further computer-vision research.

All learning outcomes in this course are equivalent to the face-to-face (F2F) version of this course.

Course Textbook and Readings:


All course materials comply with copyright/fair use policies.
Course Overview:

This is a graduate-level course and will cover both classical and recent exciting progresses on the theory and practice of the computer vision. This course is particularly useful for those students who are interested in computer vision, vision-based pattern recognition, and robotics.

This course adopts a 100% web synchronous instructional method and there are no face-to-face class meetings. Active participation in these activities and completion of all coursework is required in this course.

- **Student-to-Instructor (S2I) Interaction**: Students will attend lectures virtually via Blackboard Collaborate Ultra at the specified class meeting time and interact with the professor through email, MS Teams or Blackboard, and (possibly) discussion boards. The professor will teach the lectures online via Blackboard Collaborate Ultra, post announcements, provide individual feedback to students, and hold online office hours via MS Teams.

- **Students-to-Student (S2S) Interaction**: Students will engage in discussions through email, the discussion board, and MS Teams or Blackboard Collaborate Ultra.

- **Student-to-Content (S2C) Interaction**: Students will engage with course content by completing assignments, projects, quizzes, exam, project presentation and other project deliverables and participating in discussion boards.

Course Communication:

I will be communicating with you regarding grades and assignments. If you need to get in touch with me, the best method is via email (tongy@cse.sc.edu). Generally, I will reply to emails within 24 hours and will provide feedback on assignments within 72 hours. You may also post questions pertaining to the course on the Blackboard Discussion Board. These questions will be answered within 24 hours. If you are having trouble with this course or its material, you should contact me via email to discuss the issues.

Announcements will be posted to this course whenever necessary. If there is any other information I think is important, I will send it to your email address you have in Blackboard. It is your responsibility to ensure that your email account works properly in order to receive email.

Below is how you check your email address in Blackboard:

- Access blackboard.sc.edu
- Click your name on the main Blackboard navigation panel on the left
- Review your email address. By default, Blackboard uses your university-issued email address

Your email address in Blackboard coincides with your preferred university email. If you are unsure of your preferred email, check your account (https://myaccount.sc.edu). For more information on setting your preferred university email, please see the How To Change Your Primary University Email Address (https://scprod.service-now.com/sp?id=kb_article_view&sysparm_article=KB0011464) Knowledge Base article.

Technology Requirements:

Online lectures will be provided through Blackboard Collaborate Ultra. Therefore, you must have access to the Internet to view/hear lectures. No special software is required.
The lecture presentations, links to articles, assignments, quizzes, and rubrics are located on the Blackboard site for the course. To participate in learning activities and complete assignments, you will need:

- Access to a working computer that has a current operating system with updates installed, plus speakers or headphones to hear lecture presentations;
- Reliable Internet access and a UofSC email account;
- A current Internet browser that is compatible with Blackboard (Google Chrome is the recommended browser for Blackboard);
- Microsoft Word as your word processing program;
- Microsoft Teams for virtual office hours and
- Reliable data storage for your work, such as a USB drive or Office365 OneDrive cloud storage.

If your computer does not have Microsoft Word, Office 365 ProPlus package is available to you free of charge and allows you to install Word, Excel, PowerPoint, Outlook, OneNote, Publisher, and Access on up to 5 PCs or Macs and Office apps on other mobile devices including tablets. Office 365 also includes unlimited cloud storage on OneDrive. To download Office 365 ProPlus, log into your student (University) email through a web browser, choose Settings (top right corner), and select software. If you have further questions or need help with the software, please contact the Service Desk (https://www.sc.edu/about/offices_and_divisions/university_technology_services/support/servicedesk.php).

**Minimal Technical Skills Needed:**

Minimal technical skills are needed in this course. All work in this course must be completed and submitted online through Blackboard. Therefore, you must have consistent and reliable access to a computer and the Internet. The minimal technical skills you have include the ability to:

- Organize and save electronic files;
- Use UofSC email and attached files;
- Check email and Blackboard daily;
- Download and upload documents;
- Locate information with a browser; and
- Use Blackboard.

**Grading System:**

All grades will be posted on Blackboard. You are strongly encouraged to check your scores in Blackboard regularly. A final letter grade will be assigned based on:

- A (90-100%), B+ (86-89%), B (80-85%), C+ (76-79%), C (70-75%), D+ (66-69%), D (60-65%), and F (0-59%)

**Grading Policy:**

- Homework assignments (4) 5% each
- Programming projects (2) 10% each
- Midterm exam (1) 15%
- Final project & presentation 30% in total
- Quizzes (10) 15% in total
Course Assignments:

All course deadlines are listed in Eastern Time Zone.

- **Homework assignments**: there will be four homework assignments. These assignments should be completed individually and independently (do NOT work in groups).

- **Programming projects**: there will be two programming projects. For each project, you will be asked to use C++, Matlab or a programming language you prefer to implement algorithms we learn in class to solve a given computer vision problem. Teamwork is allowed for the second programming project. Details will be released in the specific assignments.

- **Midterm exam**: there will be a midterm exam. The content of the exam will be notified in lecture. Most of the materials you will be tested on comes from class lectures and may or may not be included in the textbook(s). Make-up exam is not allowed except excusable absences ([http://bulletin.sc.edu/content.php?catoid=52&navoid=1280#Attendance_Policy](http://bulletin.sc.edu/content.php?catoid=52&navoid=1280#Attendance_Policy) with appropriate documentation and advanced notice. The exam will be secured in Blackboard with a password.

- **Quizzes**: There will be 10 quizzes during the semester, which will help you to strengthen your understanding of key concepts learned in class. The quizzes may consist of True/False, Single/Multiple Choice or Short Answer questions. Each quiz has a different weight, which will be specified individually. The quizzes will be secured in Blackboard with a password.

- **Final project**: you are asked to do a final project, which can be either a complete research project that addresses a problem in computer vision or a survey research that reviews the prior work on a computer vision topic. You will be judged on your originality, innovativeness, and research quality. Further details on the project will be communicated often throughout the course. The project has several deliverables during the semester including
  
  - An abstract
  - Research work
  - An oral presentation
  - A final written report

Details and rubrics on these deliverables will be communicated throughout the course. Missing your final project presentation will automatically result in a zero for your final project presentation grade. No late submission of final project written report is allowed.

Late Submission Policy:

A due date will accompany all homework assignments, programming projects, quizzes, exam, and deliverables of the final project. All course deadlines are listed in Eastern Time Zone. Completing and submitting the homework assignments, programming projects, quizzes, exam, and final project deliverables by the due date is the sole responsibility of you. You will be allowed to access the assignments and take quizzes an unlimited number of times until the due date/time. Please plan accordingly and complete these course assignments in advance of their deadlines to ensure any unanticipated circumstances do not result in a missed assignment. User error does not qualify you for any kind of makeup or retake opportunity.

- Late submissions of homework assignments, programming projects, or quizzes will be accepted if you complete it within the week following its due date. However, late submissions will be subject to the following penalty: 10% will be deducted from your grade for the first day late, and an additional 5% will be deducted on each subsequent day. For these assignments (homework assignments, programming projects, or quizzes), you will be granted for a **ONE-TIME waiver of late submission penalty** - you will not be penalized if you submit your assignment in three days after due date. However, if you work in a group for programming project #2, you CANNOT use the waiver if any member in your group has used the waiver before. Please notify me in advance, when you use this waiver.

- Missing your final project presentation will automatically result in a zero for your final project presentation grade.
• No late submission of final project written report is allowed.

Be Careful: The clock on your computer may be different than the clock in Blackboard. Plan accordingly. I recommend that you submit all your course assignments well before deadline.

Attendance Policy:

Success in this course is dependent on your active participation throughout the course. You are required to attend online lectures via Blackboard Collaborate Ultra at specified class meeting time and expected to complete all course requirements. Even if your work is completed, you still need to log into Blackboard to ensure that you have seen all announcements, etc. It is your responsibility to checking updates related to the course.

Academic Integrity:

You are expected to practice the highest possible standards of academic integrity. Violations of the University's Honor Code include, but are not limited to improper citation of sources, using another student's work, and any other form of academic misrepresentation. Violations of the University’s Honor Code will be reported to the Office of Student Conduct and Academic Integrity. Below are some websites for you to visit to learn more about University policies:

Carolinian Creed (http://www.sc.edu/creed)
Academic Responsibility (http://www.sc.edu/policies/staf625.pdf)
Office of Student Conduct and Academic Integrity (https://www.sc.edu/about/offices_and_divisions/student_conduct_and_academic_integrity/index.php)
Information Security Policy and Standards (https://sc.edu/about/offices_and_divisions/division_of_information_technology/security/policy/universitypolicy/)

Disability Services:

Student Disability Resource Center (SDRC) (https://www.sc.edu/about/offices_and_divisions/student_disability_resource_center/) empowers students to manage challenges and limitations imposed by disabilities. Students with disabilities are encouraged to contact me to discuss the logistics of any accommodations needed to fulfill course requirements (within the first week of the semester). In order to receive reasonable accommodations from me, you must be registered with the Student Disability Resource Center (1523 Greene Street, LeConte Room 112A, Columbia, SC 29208, 803-777-6142). Any student with a documented disability should contact the SDRC to make arrangements for appropriate accommodations.