CLARK UNIVERSITY 1887

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Mathematics and Computer Science Department

CS 201: Computer Vision

Fall Semester 2014
http://www.cs.clarku.edu/~jmagee/cs201/

Class Meetings @ BP 326
Tue, Fri 1:25pm – 2:40pm

Lab Meetings @ BP 310:
Fri 12:00pm – 1:15pm

John Magee, Instructor
jmagee@clarku.edu
Always include "CS201" in the subject.

Office hours @ BP 332:
just drop by if I'm in!
Planned hours:
Tue 11:00am – 12:00pm
Fri 11:00am – 1:00pm
and by appointment

Course Description

This course studies computer vision with a particular application to human-computer interaction. Students learn about computer vision techniques to create computer systems that analyze images automatically and determine what the computer "sees". The computer vision system is then used to create new interfaces for human users. Students investigate research methods in human-computer interaction and apply them to creating video-based interactive systems. Students gain practical experience designing, implementing, and testing a project.

Topics include:

- Image and video formats
- Basic and advanced computer vision methodology
- OpenCV Library
- Microsoft Kinect
- Face detection and tracking
- Human body modeling
- Feature tracking
- Interactive video games
- Systems for people with disabilities
- Human subjects, and evaluation methodology

Prerequisite:

1 year programming experience (e.g., C, C++ or Java at CS 121 level) and algorithms (CS160). Familiarity with algebra, probability, statistics, and calculus will be helpful. Linear Algebra may be useful for some advanced projects.

Books

The main book for this course:

Computer Vision: Models, Learning, and Inference
By Simon Prince
Full book PDF available free for students: http://www.computervisionmodels.com/

I recommend the following books as additional resources:

Computer Vision: Algorithms and Applications.
By Richard Szeliski
http://szeliski.org/Book/

Research Methods in Human-Computer Interaction
by Jonathan Lazar, Jinjuan Heidi Feng and Harry Hochheiser

Learning OpenCV: Computer Vision in C++ with the OpenCV Library (2nd edition)
by Gary Bradski, Adrian Kaehler

Other online readings and tutorials will be posted to the schedule page.

Software

For the applied parts of the course, we will use various software packages:

- Programming language/IDE of your choice
- OpenCV Computer Vision Library
- Matlab
- Microsoft Kinect SDK

Grading

The following percentages are tentative and may be changed at my discretion at any time:

Attendance, participation, professionalism	10%
Homework Assignments	35%
Project (design, results, presentation)	25%
Quizzes	30%

Withdrawing from the Course

If you feel that you want to drop or withdraw from the class, please come talk to me about it as early as possible; I want to help you succeed, but you need to ask for help.
Add/Drop period ends Wednesday September 3, 2014 at 11:59pm
The last date to withdraw and receive a "W" grade is Friday, October 31, 2014.

Policies and Miscellaneous

The official administrative business of this class will be conducted by email.
Grade questions/disputes, explanation of absence, etc. will be processed via email so that we both have a written record of what was agreed. Feel free to discuss in person but an email follow-up is required for the official record.

Attendance and discussion/asking questions are expected and will be reflected in your grade.
If you must be absent, please email me in advance to let me know why you won't be in class, and to let me know what you will do to keep up with the assignments.
CS 201 is not a correspondence course. Inadequate attendance is grounds for a grade of F.

Computer Use Policy
Computers and cell phones should be put away unless you are actively using them for class purposes with my permission. Do not use class time to work on other homework, play games, check email, check Facebook, or surf the web. Such activities can be distracting to other students.

Assignments are due on the date stated on the homework assignment (to be posted on web).

- Assignments received within 0-24 hours of the deadline will be accepted with a 10% penalty.
- Assignments received within 24-48 hours of the deadline will be accepted with a 20% penalty.
- Assignments received more than 48 hours past the deadline will not be accepted or graded.

Plan your work accordingly, and work on all assignments as soon as they are given so you can ask questions in class and get assistance in the labs and tutoring hours.

> Students are responsible for ensuring that assignments are correctly submitted. If you have a question or problem, seek help from CS 201 staff immediately.

No special make-up work will be accepted after the end of the semester. Don't even ask.
In the event of a documented major medical problem, a grade of Incomplete will be given pending the submission of complete work. However, make up work "to improve one's grade" will not be accepted.

It is the student's responsibility to retain all papers, quizzes, and exams that have been graded and returned. Should these original documents not be available in the event of a grade dispute, I will need to defer to the own records.

Grades are not negotiable. Don't even ask – just do the work and you'll get the grade you deserve. Of course, please bring any clerical grading errors to my attention by email and I will gladly fix them.

Students with academic accommodations. Please let me know privately if you have a disability that necessitates academic accommodations.

Plagiarism, Collaboration, and Collusion

Unless otherwise specified, all CS201 homework assignments are **independent work**.

It is the student's responsibility to know and understand the Clark University Academic Integrity policy, which is within the Academic Advising Handbook (The Blue Book) available at the Academic Advising Center.

In addition to the definition of plagiarism in the handbook, **with respect to CSCI201, plagiarism is specifically defined to include (but is not limited to) the following**:

- collaboration on the solutions/code you write
- copying any part of someone else's assignment/program, even if you have permission and/or have modified the code
- sharing or giving your assignment/code or even a subset of your assignment/code to another student to review
- reviewing another student's solution (including from past semesters)
- reviewing solutions on the internet

It is my policy to use automatic plagiarism detection software, and suspicious similarities will be uncovered. The University takes acts of cheating and plagiarism very seriously; violators may be suspended or fail the course.

What is acceptable cooperation?
Cooperation is recommended in understanding programming concepts and system features. You are encouraged to discuss the homework problem statements and expected output, and to seek and receive help with programming languages, IDEs, libraries, and other tools.

However, each student must write his or her own solution/code and other deliverables independently.