

Introduction to Computer Vision

Carleton University School of Computer Science
COMP 4102A, Dr. Gerhard Roth gerhardroth@cmail.carleton.ca

Preliminary course outline subject to change; last updated on November 20th, 2018

Class Schedule

Classroom: Loeb Building Room C164

Class Times: Wednesday and Friday 16:05 – 17:25

Course Website: <http://people.scs.carleton.ca/~roth/comp4102a-19>

Office Hours: Wed and Friday 2:00 PM to 4:00 PM in 5331HP

Teaching Assistants

| T.A. | Email | Office Hours | Room |
|------|-------|--------------|------|
|------|-------|--------------|------|

There is no TA, I do all the marking. Send e-mail to gerhardroth@cmail.carleton.ca

Course Description

This course introduces the basic ideas and techniques of computer vision. The central theme is constructing 3D models from 2D images.

Topics Covered

Topics include: image formation, image feature extraction, camera models, camera calibration, structure from motion, stereo, recognition, augmented reality, active vision.

Prerequisites

Basic linear algebra and calculus, programming skills in C++ or Python.

Course Objectives

Basic understanding of computer vision and image processing, especially the problem of constructing 3d models from 2d images.

Textbook (s)

There is no official textbook. I will hand out notes, and there are lecture notes online at the specified web site and on CuLearn.

Online and Other Resources

<http://people.scs.carleton.ca/~roth/comp4102a-19>

Library Reserves

There are no library reserves

Laboratory Software

OpenCV is necessary for the assignments. It runs on Windows, MAC or Linux, and should be installed on your computer. There are instructions on the web site about installing OpenCV.

Evaluation

Students will be evaluated in this course according to the following measures.

| Component | Weight |
|---------------|---------------------------------------|
| Assignments | 4 or 5 counting for 40% |
| First Midterm | Feb 15, in class, counting for 30% |
| Final exam | counting for 30% (or 60% - see below) |

Evaluation Note

The midterm is in class, right before the reading week. The midterm and final exam each count for 30%, but if the final exam mark is > midterm mark it counts for 60%. Writing the midterm is optional but is a good idea.

Midterm Note

Students must retain all assignments and midterm results in case of questions regarding correctness of recorded marks. The marks will be posted on-line. The students should ensure that the posted marks are correct. Any complaints regarding assignment marks should be brought to the attention of the T.A. who marked it (only if the T.A. does not address the problem to your satisfaction should you bring the matter to the instructor). This should be done no later than one week after the assignment has been marked. After this time no remarking will be done.

Collaboration Policy

Collaborating on assignments is strictly disallowed. You must complete the work by yourself. If you need help, please see a TA or your instructor. Posting assignment solutions on discussion boards before the due date and time is also prohibited.

Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP, by telephone at 520-2600, ext. 4364 or by email at undergraduate_advisor@scs.carleton.ca. The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and the Writing Tutorial Services.

University Policies

Student Academic Integrity Policy

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar.

Plagiarism

As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science.

Unauthorized Co-operation or Collaboration

Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.

Academic Accommodations for Students with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity

Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at <http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines>

Religious Obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www2.carleton.ca/equity/>

Pregnancy Obligation

Write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website: <http://www2.carleton.ca/equity/>

Medical Certificate

The following is a link to the official medical certificate accepted by Carleton University for the deferral of final examinations or assignments in undergraduate courses. To access the form, please go to <http://www.carleton.ca/registrar/forms>