CIS*4720 Image Processing and Vision
Winter 2019

UNIVERSITY of GUELPH

School of Computer Science

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1 INSTRUCTIONAL SUPPORT

Section 01

Instructor:	Dr. Denis Nikitenko
Office:	Reynolds 3322
Email:	cis4720@socs.uoguelph.ca
Office hours:	By appointment only. Details will be posted on the course website. **Note:** Weekly hours will vary during the semester to better accommodate student demand and instructor schedule.

Pre-requisites:	CIS*2750, CIS*3110, (CIS*2460 or STAT*2040)
Credit Weight:	0.5

Teaching Assistants:

Email: cis4720@socs.uoguelph.ca
Office Hours: See lab times below

Timetable

Lectures:
Tuesday, Thursday, 2:30PM - 3:50PM, ROZH 105

Lab times:
Tuesday, 04:30PM - 05:20PM, Thur 01:30PM - 02:20PM THRN, Room 2418

Unless otherwise stated, lab times will be used for advising and consulting with the Teaching Assistant. Students do not have to come to their assigned lab, and may attend any lab if they have questions.

2   LEARNING RESOURCES

2.2 Course Website

Course material, news, announcements, and grades will be regularly posted to the CIS*4720 website which can be found at https://moodle.socs.uoguelph.ca. You are responsible for checking the site regularly.

- Lecture Information: Selected notes will be posted on the course website as instructors have time to make them available. You are expected to take your own notes during lecture.
- Labs and Tutorials: Selected tutorial and lab materials will be available on the course website.
- Assignments: Assignment descriptions are found on the course website. Assignments are submitted via the course website.

2.3 Recommended Textbook

Solem, J.E., *Programming Computer Vision with Python,* O'Reilly and Associates, 2012
Available as an e-book.

2.4 Calendar Description

This course is an introduction to the process of image processing and computer vision. It explores the scientific, artistic, and computational aspects of these topics in the context of digital photographs, Emphasis is placed on topics such as image enhancement, image segmentation and image transformations.

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: http://www.uoguelph.ca/registrar/calendars/index.cfm?index

3 ASSESSMENT

3.1 Dates and Distribution

Assessments
Assignments (2, 50%) - Assignment 1 - 25%, February 6 - Assignment 2 - 25%, March 6 Group project (40%) - April 3 In-class presentation (10%) - Last two weeks of class

3.1.1 Final grade calculation

The final grade is the weighted sum of all assessments shown above, using the weights indicated in the list above.

3.2 Course Grading Policies

Development environment: Systems and software are provided in the lab and the SoCS Linux servers for use in assignments. Students who choose to develop their assignments on other systems and/or with other versions of software are fully responsible for ensuring compatibility with the SoCS Linux server environment for marking purposes.

Late Assignments: All assignments are due at the time/date indicated in the assignment description. Late assignments will be accepted for **12 hours** after the deadline and penalized at **2% per hour**. Assignments that are more than 12 hours late will **not** be accepted, and will automatically receive the grade of **zero** (0). See below for compassionate exceptions.

Compiler errors/warnings: Program code which does not compile will not be accepted for marking and a grade of **zero** (0) will be assigned. Code that does not compile "clean" will lose marks for compiler warnings. Code **must** compile and run on the SoCS servers.

Submission errors: Failure to submit assignments correctly (e.g., incorrect file names, faulty/missing build scripts, etc.) will result in a mark penalty.

Regrades: Students may request a regrade of an assignment or midterm exam if the marker has made an error in grading. The original submission will be entirely regraded and a new mark will be assigned. It is possible for a mark to go down, go up, or remain unchanged as a result of a regrade. Students must request a regrade via Regrade link on the course website within 5 calendar days of receiving the assessment grade.

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please make an appointment to meet your course instructor. Please see below for specific details and consult the undergraduate calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course email address within two weeks of the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

3.3 Course Learning Outcomes

1. Appreciate the role of image processing and computer vision in the real world.
2. Develop an understanding of the principle concepts and algorithms associated with image processing and computer vision.
3. Apply image processing and computer vision algorithms to real world problems.
4. Design and implement image processing and computer vision algorithms, and extend existing algorithms from the literature.

4 TEACHING AND LEARNING ACTIVITIES

4.1 Lecture Schedule

Lectures	Lecture Topics	Delierables
Week 1	Introduction to image processing	
Week 2	Fundamental image processing algorithms	
Week 3	Fundamental image processing algorithms	
Week 4	Working with colour	
Week 5	Advanced segmentation and edge detection	Assignment 1
Week 6	Advanced segmentation and edge detection	
Break week		
Week 7	Applications of image processing	
Week 8	Image morphology	Assignment 2
Week 9	Image morphology / Combining images	
Week 10	Combining images	
Week 11	In-class presentations	In-class presentations
Week 12	In-class presentations	In-class presentations Group project

4.4 Important Dates

Monday January 7: First day of classes
Monday February 18 - Friday February 22: No Classes (reading week)
Friday March 8: 40th Class Day - last day to drop the course
Friday April 5: Last day of classes
Friday April 12: Final exam

5 ROLES AND RESPONSIBILITIES

5.1 Communication & Email Policy

Please use lectures, lab sessions, and the website discussion forum as your main opportunities to ask questions about the course. Questions that are specific to your particular situation may be emailed to cis4720@socs.uoguelph.ca and will be answered by one of the members of the instructional team. Extremely private communication should be conducted in person by making an appointment with the course instructor.

Major announcements will be posted to the course website. It is your responsibility to check the course website regularly. As per university regulations, all students are required to check their <mail.uoguelph.ca> e- mail account regularly: e-mail is the official route of communication between the University and its students.

5.2 Recording of materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course and may not be posted on any public space unless further permission is granted.

5.3 Instructor's Role and Responsibility to Students

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected notes will be made available to students on the course website but are not intended to be stand-alone. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for exams and assignments.

5.4 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures, labs and help sessions. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed as early as possible. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

6 ACADEMIC INTEGRITY

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. All students who take a SOCS course must pass the **Academic Integrity Self Test.**

For educational purposes, instructors impose conditions on assignments that may limit students' permission to collaborate with others or to utilize external sources (including, but not limited to, software, data, images, text, etc.). Any permitted utilization must be done with proper references. Aiding and abetting is a punishable offence; students must be careful not to help others commit offences by giving out solutions or providing to access computer accounts. Instructors may use automated tools to detect possible cases of academic misconduct.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

The SOCS Academic Integrity Unit:
http://moodle.socs.uoguelph.ca/course/view.php?id=2   Login with your central login credentials. The key to use is "imhonest".

7 ACCESSIBILITY

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas