ELEC 536 – Computer Vision

Term – Spring 2018 (201801)

Instructor	**Office Hours**
Dr. Alexandra Branzan Albu	Days: Tue
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Course Objectives

To provide students with the basic skills needed to analyze, formalize, and solve Computer Vision problems.

Learning Outcomes

Upon completion of this course, the students will be able to:
- understand basic concepts, mathematical tools, algorithms for digital image processing, and classification of visual patterns
- implement an algorithm to solve a specific computer vision problem
- evaluate the performance of the algorithm using quantitative evaluation methods
- recognize and analyze ethical dilemmas specific to computer vision applications.

Syllabus

Overview of the main concepts and methods in computer vision; geometry and physics of imaging, as related to image formation and representation; image preprocessing for feature extraction; image segmentation; binary shape analysis; texture analysis; motion analysis and tracking; feature selection; pattern recognition.

A-Section(s): A01 / CRN 21142

Days: Monday and Thursday
Time: 8:30-10:00
Location: ELL162

Required Text

Title: Concise Computer Vision: An Introduction into Theory and Algorithms
Author: Reinhardt Klette
Publisher: Springer
Year: 2014

References: Additional mandatory readings will be posted regularly on the course web site.

Assessment:

Programming Assignments:	20%	Dates: TBA	
Reflections:	5%	Dates: TBA	
Speculative essay:	5%	Dates: TBA	
Mid-term:	30%	Dates (tentative): February 22 and March 29	
Project:	35%		
Class participation:	5%		

Notes:
- There will be **four programming assignments**. All assignments are worth 5% of the final mark.
- **Reflections:** Every two/three weeks, three questions related to required readings on the social, economical or cultural impact of computer vision technologies will be posted on CourseSpaces. Students will choose one question and do a 1 page write-up responding to that question.
- **Speculative essay:** The goal of this assignment is to make sense of impacts of computer vision technologies by assessing potential risks and harms to be avoided during algorithmic design.
- There will be **two midterms**, each worth 15% of the final mark.
- The **project** will involve several deliverables: two oral presentations, one progress report, and one final report.
- The mark for **class participation** will consider class attendance records, as well as the level of engagement during class discussions and oral presentations.
- There will be no final exam.
- Failure to pass the cumulative mark of midterms will result in a failing grade for the course.

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Graduate Calendar. https://web.uvic.ca/calendar2018-01/grad/academic-regulations/grading.html

Note to Students: Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the Chair of the Department by email or the Chair's Assistant to set up an appointment.

Accommodation of Religious Observance:
https://web.uvic.ca/calendar2018-01/grad/registration/Registration.1.16.html

Policy on Inclusivity and Diversity:
https://web.uvic.ca/calendar2018-01/general/policies.html

Standards of Professional Behaviour: You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, which contains important information regarding conduct in courses, labs, and in the general use of facilities.
http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult the entry in the current Graduate Calendar for the UVic policy on academic integrity.
https://web.uvic.ca/calendar2018-01/grad/academic-regulations/academic-integrity.html

Equality: This course aims to provide equal opportunities and access for all students to enjoy the benefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for

appropriate accommodation. Alternatively, you may want to contact the Resource Centre for Students with a Disability located in the Campus Services Building.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

Course Lecture Notes

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.