University of Victoria

Faculty of Engineering | Electrical and Computer Engineering
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COURSE OUTLINE

ECE 536 – Computer Vision

Term – SPRING 2021 (202101)

Instructor

Tunai Porto Marques
Phone: 2509514665
E-mail: tunaip@uvic.ca

Office Hours

Days: Thursday
Time: 2:00PM – 4:00PM
Location/Platform/link: Virtual / **Zoom** / https://uvic.zoom.us/j/83643745976

Course Objectives

To provide students with the basic skills needed to analyze, formalize, and solve Computer Vision problems. Students will learn traditional computer vision methods that are mature, and also develop a high-level understanding of how deep learning works from a fundamental computer vision perspective.

Learning Outcomes

- The course aims to provide students with the opportunity to research and implement computer vision-based projects through guided assignments, in addition to midterm and final assessments. After the completion of the course, students are expected to:

  - Understand when to use, as well as the advantages and disadvantages of traditional computer vision methods versus deep learning ones;
  - Learn how to integrate the two methodologies to solve specific problems;
  - Have the opportunity to carefully interpret state-of-the-art methods in works from top-tier computer vision conferences (i.e., activities planned for the final project)
  - Understand how deep learning models have evolved from a generalization of traditional computer methods;
  - Have a working knowledge of computer vision and Python

Syllabus

The course will consist of an individual project ("final project"), one online midterm exam, and four assignments that are designed to guide students through implementing diverse computer vision-based projects individually. The semester will conclude with the submission of the "final project", where graduate students will study and summarize several papers from a given topic that were recently published in top-tier computer vision conferences. General topics to be covered during this course include -- image formation, histograms, color spaces, image filtering, edges, pyramids, visual features, clustering and segmentation, linear classifiers, optimizers, object detection and image classification.

A-Section(s): A01 / CRN 20949   TA (ahm.magdy90@gmail.com)
Days: Monday and Thursday
Time: 10:00 am – 11:20 am
Location/Platform/link: Virtual / **Zoom** / https://uvic.zoom.us/j/84784014093

Optional Textbook

Title: Computer Vision: Algorithms and Applications, 2nd ed. (available free at: https://szeliski.org/Book/)
Author: R. Szeliski
Publisher: Springer
Year: 2020

Online Course Delivery:

As this course will be conducted online during this term, students will need to complete assignments online. The students will require access to a computer which has the following software installed:

- Zoom (online Lectures and Office hours)
- Slack (asynchronous questions and main point of contact with the TA)
- Web browser (to access Google Colab and complete the assignments)

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

Assessment:

Assignments:	55%	Due Dates: Jan. 28 (A1), Feb. 8 (A2), Mar. 15 (A3), Mar. 25 (A4)
Mid-term	20%	Date: February 25
Final Project	25%	Due date: April 1 (Video presentation), April 8 (Q&A)

Important: All deadlines and schedules for this course will reference Pacific Standard Time until March 14, 2021 and then Pacific Daylight Time.

Note:

There will be four assignments: first assignment is worth 10% of the final mark and the rest are worth 15% of the final mark.

Failure to pass the cumulative mark of assignments 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://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/B13jeiMdE?bc=true&bcCurrent=07%20-%20Grading&bcItemType=policies

There will be no supplemental examination for this course.

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 Secretary to set up an appointment.

Course Withdrawal Deadlines:

- January 19, 2021: Withdrawal with 100% reduction of tuition fees (under review)
- February 9, 2021: Withdrawal with 50% reduction of tuition fees (under review)
- February 28, 2021: Last day for withdrawal (no fees returned) (under review)

Accommodation of Religious Observance:

https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/SkmigiMOV?bc=true&bcCurrent=17%20-%20Accommodation%20of%20Religious%20Observance&bcItemType=policies

Policy on Inclusivity and Diversity:

Engineering: https://www.uvic.ca/engineering/about/equity/index.php

Academic Calendar:

https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/HkQ0pzdAN?bc=true&bcCurrent=%20General%20University%20Policies&bcGroup=General%20University%20Policies&bcItemType=policies

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

Academic Integrity:

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://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/BJujesM_E?bc=true&bcCurrent=02%20-%20Policy%20on%20Academic%20Integrity&bcItemType=policies

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 Centre for Accessible Learning located in the Campus Services Building: https://www.uvic.ca/services/cal/. 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.

Sexualized Violence Prevention and Response at Uvic:
UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support, please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:
  Where: Sexualized violence resource office in EQHR; Sedgewick C119
  Phone: 250.721.8021
  Email: svpcoordinator@uvic.ca
  Web: www.uvic.ca/svp

Office of the Ombudsperson:
The Office of the Ombudsperson is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations. Phone: 250-721-8357; Email: ombuddy@uvic.ca, Website: https://uvicombudsperson.ca/