



IMPROVE LIFE.

College of Engineering and Physical Sciences

School of Computer Science

## Course Outline (Fall 2024)

# CIS\*6650 – Topics in Computer Science I

## Deep Learning for Computer Vision

<b>Instructor</b>	Neil Bruce School of Computer Science Office: Reynolds 2222 Email: brucen@uoguelph.ca Office Hours: To be determined
<b>Prerequisites</b>	Enrollment in a graduate program at the University of Guelph or permission from the instructor.
<b>Description</b>	An exploration of recent methods for the application of deep neural networks to problems in computer vision. The course will begin with a high-level overview of deep neural networks, convolutional neural networks and vision transformers. The lecture style format will then shift to a seminar style format, which will consist of discussion of recent and impactful papers at the intersection of deep learning and computer vision.
<b>Reference Textbooks</b>	No textbook is required, and course notes / slides will provide the most relevant coverage. Following are some recommended textbooks for additional reference.

	<p>Foundations of Computer Vision          By Antonio Torralba, Phillip Isola and William T. Freeman          ISBN: 9780262048972          Pub date: April 16, 2024          Publisher: The MIT Press</p> <p>Please also see the CourseLink site for additional resources.</p>								
<b>Course Organization</b>	See the courseLink site for details.								
<b>Topics Covered</b>	Topics covered will include a selection of topics related to computer vision and deep learning, including recent and advanced methods.								
<b>Learning Objectives</b>	<p>At the end of the course, a successful student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand fundamental principles, ideas and techniques in modern computer vision</li> <li>2. Understand appropriate methods and algorithms for solving a broad array of fundamental problems in computer vision</li> <li>3. Be familiar with important recent literature and have a greater aptitude for conducting research incorporating modern methods in computer vision as a tool</li> </ol>								
<b>Evaluation &amp; Feedback</b>	<table border="1" data-bbox="414 1251 867 1524"> <tr> <td>Participation</td> <td>15 %</td> </tr> <tr> <td>Presentation</td> <td>15%</td> </tr> <tr> <td>Project Proposal</td> <td>20%</td> </tr> <tr> <td>Final Project</td> <td>50 %</td> </tr> </table> <p>Project Proposal outline will be handed out on September 11th, Proposals will be due on October 18<sup>th</sup></p> <p>Final projects will be due on Friday December 1st at 11:59 pm</p>	Participation	15 %	Presentation	15%	Project Proposal	20%	Final Project	50 %
Participation	15 %								
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Project Proposal	20%								
Final Project	50 %								

<b>Grading requirements</b>	To pass the course you require a minimum grade consistent with your program.
<b>Information Technology and electronic devices</b>	Please exercise appropriate use of laptop computers and other electronic devices in the classroom, and refrain from use of cellular phones except in the case of urgent or extenuating circumstances.
<b>Evaluation Guidelines</b>	<ul style="list-style-type: none"> <li>● All course elements will be graded according to the rubric provided with each assigned course element.</li> <li>● The course project will involve identifying a problem domain to address using computer vision, and producing a report of results including evaluation measures and visualizations where appropriate</li> </ul>
<b>Missed Evaluations</b>	<p>When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor in writing, with your name, id#, and e-mail contact. See the academic calendar for information on regulations and procedures for Academic Consideration:  <a href="http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml">http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml</a></p> <p><b>No late assignments will be accepted without a reasonable explanation</b>, which may require documentation, at the discretion of the instructor. In all cases where language in this outline is ambiguous, the link regarding Academic Consideration provided above will take precedence.</p>
<b>Communication with Students</b>	<p>Only University of Guelph e-mail accounts are to be used for communication with students or the instructor. <b><i>Emails sent from other accounts may not be answered!</i></b> E-mails should be written in a way that is appropriate for a professional context. Indicate your course and section, formulate your question clearly, check spelling (names AND content) and use a polite language. Read the course outline before contacting the instructor or seminar leaders, you might find the answer here.</p>
<b>Course Content</b>	See the courseLink site for lecture content and all assignments and project related content.

<b>Accessibility</b>	<p>The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible. For more information, contact SAS at 519-824-4120 ext. 56208 or email <a href="mailto:sas@uoguelph.ca">sas@uoguelph.ca</a> or see the website: <a href="https://wellness.uoguelph.ca/accessibility/">https://wellness.uoguelph.ca/accessibility/</a></p>
<b>Academic Misconduct</b>	<p>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. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. 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 or faculty advisor.</p> <p>The Academic Misconduct Policy is detailed in the Undergraduate Calendar: <a href="https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml">https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml</a></p>
<b>Diversity and Inclusion Statement</b>	<p>In this course I would like to create a learning environment that supports a diversity of thoughts, perspectives and experiences, and honors your identities (including race, gender, class, sexuality, religion, ability, etc.)</p>
<b>Land Acknowledgement</b>	<p>The University of Guelph resides on the treaty lands and territory of the Mississaugas of the Credit. We recognize this gathering place where we work and learn is home to</p>

	<p>many past, present, and future First Nations, Inuit, and Métis peoples. Our acknowledgement of the land is our declaration of our collective responsibility to this place and its peoples' histories, rights, and presence. Our school supports and adds our collective voice to the "CALLS TO ACTION" from the Truth and Reconciliation Committee on Indian Residential School to never forget, to hold governments and colonial forces to account, to seek redress and healing for injustice.</p>
<p><b>COVID Related</b></p>	<p><b>Disclaimer</b></p> <p>Please note that the COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.</p> <p>This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<a href="https://news.uoguelph.ca/2019-novel-coronavirus-information/">https://news.uoguelph.ca/2019-novel-coronavirus-information/</a>) and circulated by email.</p> <p><b>Illness</b></p> <p>Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).</p> <p>For information on current safety protocols, follow these links:  <a href="https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/">https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/</a>  <a href="https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces">https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces</a></p> <p>Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.</p>