Course Outline

Faculty of Science

CSCI 4050U - Machine Learning
Fall 2019

*1. Course Details & Important Dates**

Lectures	Tutorials & Laboratories
MW8-930	See https://ontariotechu.ca/mycampus/available-courses.php for details

* for other important dates go to: www.uoit.ca >Current Students >Important Dates

2. Instructor Contact Information

Instructor	Teaching Assistant
Ken Pu Office: UA4041 Extension: x3444 Email: ken.pu@ontariotechu.net Office Hour: TBA	**Andrei Stoica** <andrei.stoica@ontariotechu.net>

3. Course Description

This course introduces the theoretical foundation and practical working knowledge of Machine Learning. We will review elements of linear algebra, calculus and probability that are necessary to understand algorithms in machine learning. We will cover neural networks, their basic learning algorithms, architectures, applications and limitations. Students will also be introduced to other neural computations such as support vector machine, kernel methods, and recent successes of neural computation in the field of computer vision, natural language processing, and language understanding.

4. Learning Outcome

1. Different types and architectures of neural networks
2. Other learning based algorithms
3. Understanding the importance of regulation and validation
4. Implementation of learning algorithms using general programming

languages and numerical libraries
5. Solving practical problems with learning algorithms and neural computation

5. Course Design

Two 1.5-hour lectures
One 1.5-hour lab

6. Outline of Topics in Course

1. Elements of linear algebra and calculus
2. Models for random variables and parameter estimation
3. Perceptron and multi-layer perceptron
4. Backpropagation algorithm
5. Architectures of neural networks
6. Support vector machine and kernel methods
7. Applications: computer vision
8. Applications: natural language processing

7. Required Text & Readings

Notes and online material will be announced.

8. Evaluation Method

- Quizzes
- There will be three assignments to be announced through Blackboard.
- There will be one midterm
- There will be a final exam.

Final course grades may be adjusted to conform to program or Faculty grade distribution profiles. Further information on grading can be found in Section 5 of the UOIT Academic Calendar.

9. Assignments & Tests

Quizzes	10
Assignment 1	10
Assignment 2	10
Assignment 3	10
Midterm	20

Final Exam	40

Missed tests or assignments are to be handled by the policies outlined by the Faculty of Science: http://uoit.ca/main/current-students/academics-and-programs/programs-and-resources/academic-integrity/process-forms/UOIT%20Regulations%20on%20Academic%20Conduct/index.php

10. Assessibility

Students with disabilities may request to be considered for formal academic accommodation in accordance with the Ontario Human Rights Code. Students seeking accommodation must make their requests through the disability services department in a timely manner, and provide relevant and recent documentation to verify the effect of their disability and to allow the University to determine appropriate accommodations.

Accommodation decisions will be made in accordance with the Ontario Human Rights Code. Accommodations will be consistent with and supportive of the essential requirements of courses and programs, and provided in a way that respects the dignity of students with disabilities and encourages integration and equality of opportunity. Reasonable academic accommodation may require instructors to exercise creativity and flexibility in responding to the needs of students with disabilities while maintaining academic integrity.

11. Professional Conduct (if applicable)

12. Academic Integrity

Students and faculty at UOIT share an important responsibility to maintain the integrity of the teaching and learning relationship. This relationship is characterized by honesty, fairness and mutual respect for the aim and principles of the pursuit of education. Academic misconduct impedes the activities of the university community and is punishable by appropriate disciplinary action.

Students are expected to be familiar with UOIT's regulations on Academic Conduct (Section 5.15 of the Academic Calendar) which sets out the kinds of actions that constitute academic misconduct, including plagiarism, copying or allowing one's own work to copied, use of unauthorized aids in examinations and tests, submitting work prepared in collaboration with another student when such collaboration has not been authorized, and other academic offences. The regulations also describe the procedures for dealing with allegations, and the sanctions for any finding of academic misconduct, which can range from a written reprimand to permanent expulsion from the university. A lack of familiarity with UOIT's regulations on academic conduct does not constitute a defense against its application.

Further information about academic misconduct can be found in the Academic Integrity link on your laptop.

13. Turnitin

UOIT and faculty members reserve the right to use electronic means to detect and help prevent plagiarism. Students agree that by taking this course all assignments are subject to submission for textual similarity review by Turnitin.com. Assignments submitted to Turnitin.com will be included as source documents in Turnitin.com's restricted access database solely for the purpose of detecting plagiarism in such documents for five academic years. The instructor may require students to submit their assignments electronically to Turnitin.com or the instructor may submit questionable text on behalf of a student. The terms that apply to UOIT's use of the Turnitin.com service are described on the Turnitin.com website.

Students who do not wish to have their work submitted to Turnitin.com must inform their instructor at the time the work is assigned and provide with their assignment a signed Turnitin.com Assignment Cover sheet: http://www.uoit.ca/assets/Academic~Integrity~Site/Forms/Assignment%20Cover%20sheet.pdf

Further information about Turnitin can be found on the Academic Integrity link on your laptop.

14. Final Examination

Final examinations are held during the final examination period at the end of the semester and may take place in a different room and on a different day from the regularly scheduled class. Check the published Examination Schedule for a complete list of days and times.

Students are advised to obtain their Student ID Card well in advance of the examination period as they will not be able to write their examinations without it. Student ID cards can be obtained at the Campus ID Services, in G1004 in the Campus Recreation and Wellness Centre.

Students who are unable to write a final examination when scheduled due to religious publications may make arrangements to write a deferred examination. These students are required to submit a Request for Accommodation for Religious Obligations to the Faculty concerned as soon as possible and no later than three week prior to the first day of the final examination period.

Further information on final examinations can be found in Section 5.24 of the Academic Calendar.

15. Course Evaluation

Student evaluation of teaching is a highly valued and helpful mechanism for monitoring the quality of UOIT's programs and instructional effectiveness. To that end, course evaluations are administered by an external company in an online, anonymous process during the last few weeks of classes. Students are encouraged to participate actively in this process and will be notified of the dates. Notifications about course evaluations will be sent via e-mail, and posted on Blackboard, Weekly News and signage around the campus.

Additional UOIT Policies **(as provided by Faculty of Science)**

UOIT is committed to the prevention of sexual violence in all is forms. For any UOIT student who has experienced Sexual Violence, ***UOIT can help****. UOIT will make accommodations to cater to the diverse backgrounds, cultures, and identities of students when dealing with individual cases.*
If you think you have been subjected to or witnessed sexual violence:

1. *Reach out to a Support Worker, who are specially trained individuals authorized to receive confidential disclosures about incidents of sexual violence. Support Workers can offer help and resolutions options which can include safety plans, accommodations, mental health support, and more. To make an appointment with a Support Worker, call 905.721.3392 or email supportworker@uoit.ca*
2. *Learn more about your options at: www.uoit.ca/sexualviolence*

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact studentlife@uoit.ca for support.

Furthermore, please notify your professor if you are comfortable in doing so. This will enable them to provide any resources and help that they can.