Learn ai

There are hundreds of undergraduates at the University of Toronto who are eager to learn how they can actually use machine learning to come up with cool solutions to hard problems. The course which we have developed and named LearnAI aims to satisfy this demand.

U of T AI

We are a team of students at the University of Toronto who work to create opportunities for undergraduates to kickstart their career in machine learning.

Through a variety of initiatives, including educational programs, competitions, guest lectures, and conferences, we help UofT students get involved in the growing field of Artificial Intelligence. Our club's activities introduce our members to an assortment of topics within the field, familiarize them with cutting-edge research, and connect them with a range of career opportunities available in today's workforce.

Introduction

LearnAI is a 12-week program run by *UofT AI*, designed to teach undergraduate students about machine learning. Exposure to AI and machine learning is very limited before graduate-level studies, especially the practical aspects. LearnAI closes this gap, and provides valuable resources such as a curriculum and mentors, so that motivated students can delve into the field early.

Students will learn the theory behind the concepts through lecture, and then apply that knowledge in workshops. Our goal is to prepare students to complete a final project that is of their own choosing, or be paired with an industry partner to solve a real-world problem. Most of all, this course aims to kickstart the careers of young and capable students who put in the effort and take initiative.

Structure

Phase One: Learning (8 weeks)

- Weekly two-hour lessons; 1 hour of lecture to learn both high-level and technical concepts, followed by a 1 hour of workshop

- Begin forming groups part-way through to prepare for phase two of the course

Phase Two: Projects (4 weeks)

- Weekly two-hour meetings continue, where groups work on their projects

- Projects may be selected personally, or you can partner with a company or organization to solve an existing, real-world problem using course knowledge

- Talks from AI researchers and people working in the field

Objectives

▸ Gain an intuitive understanding of the core concepts involved in modern machine learning

▸ Apply this understanding in a practical way, through weekly workshops following each lecture, and a project in the second half of the program

▸ Join a community of eager and enthusiastic students and Tasks well as the broader community (Partners, UofT profs, Guest Lecturers, etc.)

Topics Covered

Week 1: Introduction & Data Types
- Become acquainted with the lecturer and mentors
- Get a glimpse of the importance and uses of artificial intelligence
- Google Colab and the datatypes used throughout the course

Week 2: Data Manipulation (Pandas)
- Loading CSVs and manipulating datasets through the Pandas library

Week 3: Data Manipulation (Numpy)
- Numpy arrays and how to prepare data as inputs to machine learning models

Week 4: Classification & Regression
- High-level concepts behind the base utilizations of ML: Classification & regression
- Apply those concepts practically to create a simple model

Week 5: Neural Networks 1
- Perceptrons, inputs & outputs, layers, model performance, and overfitting
- Create a neural network and tackle regression, tweaking hyper-parameters to improve performance

Week 6: Neural Networks 2
- Activation functions, a deeper look at performance testing/validation, and back-propagation (gradient descent)
- Apply data manipulation concepts and create a neural network for classification

Week 7: Computer Vision
- Computer vision field overlook
- Convolutional neural networks (CNNs) intuition and maths
- Create a CNN and tackle an object-recognition problem

Week 8: Natural Language Processing
- Natural language processing field overlook
- Recurrent neural networks (RNNs) intuition and maths
- Create an RNN and tackle a language-based problem