Introduction to Machine Learning (IML)

LECTURE #1: INTRODUCTION

236756 – 2024-2025 WINTER – TECHNION

LECTURER: YONATAN BELINKOV

Welcome to IML@2025w!

- **Course staff:**
  - Lecturer: Yonatan Belinkov
  - Head TA: Arkadi Piven
  - TAs: Edan Kinderman, Yonatan Elul, Eden Nagar
  - Graders:
- **Website**: https://webcourse.cs.technion.ac.il/236756/
- **Piazza**: http://piazza.com/technion.ac.il/winter2025/236766
  Please direct all academic inquiries here.
- **Course email**: 236756ML@gmail.com
  Please direct all personal inquiries here.

If you require assistance

- **Reserve duty (Miluim)**: reach out ASAP to the course staff (236756ML@gmail.com) and to the department (mazkirut)
- If you need other help due to the war or any other reason, contact us and we'll do our best to help

Course structure

- **Teaching**:
  - Class (שיעור) – weekly, 2h
    Online until further notice
  - Tutorial (תרגול) – weekly, 2h
    Four groups (online until further notice)
- **New this year:** extra tutorial hour
  - More explanations, exercises, exam questions
  - No new material
- **Assignments**:
  - Wet exercises – total of 3
  - Dry exercises – total of 4
- **Exam**

Grading policy:

- **Wet exs:** 18% of final grade (6% each)
  - 3 programming exs
  - Mandatory
  - Done in pairs
- **Dry exs:** 8% of final grade
  - 4 pencil-and-paper assignments
  - Mandatory
  - Done individually
- **Exam:** 74% of final grade
  - Must score 55+ to pass the course

Format

- Following current Technion guidelines, our course will be given **online** until other notice
- Lectures will be recorded, but **obligatory course material** is that which is given in **current classes and recitations**

- **We urge you to attend class on a regular basis**
- Coming to class has added value that cannot be obtained otherwise, even virtually
- This is clearly expressed – in grades, and in things that cannot be easily measured
- Use recorded content only when truly in need – relying on it to make life `easier' has a price

Overview

- **Machine learning is great!**
- Its also **highly competitive**
- Simply `knowing' the dry material will not get you far
- Success requires a deep understanding of how things work (and when they don't)

- Our **updated course:**
  - Is both **theoretical** and **applied**
  - Relies on **prior knowledge** – mostly probability and linear algebra
- Our course targets the **fundamentals** of machine learning
- Designed to give you an edge
- Requirements are set accordingly

Overview

- **This is not an easy course:**
  - it is intensive and fast-paced
  - makes use of and combines a variety of tools
  - has challenging homework
  - requires you to adapt a particular kind of ‘thinking’

- **To succeed:**
  - Come to class (if possible) and don’t rely on videos (especially not last minute!)
  - Do your homework – wet and dry
  - Focus on understanding (this is what we check for in the exam)
  - **Don’t take shortcuts**

Goals

- **Our goals for students:**
  - Understand learning inside-out and outside-in
  - Know how things work, why they do, and when they don't
  - Have clear mental model: plan, anticipate, debug
  - Understand assumptions: necessity, power, and limitations
  - Don’t be dazzled by the buzz
- ML is a fast-moving, fast-growing field – **be one step ahead!**

Goals

- **Our main goal – develop foundations**

- Conceptual framework
- Methods
- Tools

Goals

- **We want to differentiate you from this:**