INTRODUCTION TO
MACHINE LEARNING

Introduction and Administration

Shai Fine
Welcome

• “Introduction to Machine Learning” (236756)
  • Lectures
    • Sunday 16:30-18:30, Taub 7
    • Lecturer: Shai Fine, shai.fine@cs.technion.ac.il
  • Tutorials
    • Two groups
      • Monday 12:30-13:30, Taub 6, Nadav
      • Thursday 10:30-11:30, Taub 6, Guy
    • Head TA: Nadav Bhonker, nadavbh@cs.technion.ac.il
    • TA: Guy Uziel, guziel@campus.technion.ac.il

• Course requirements:
  • Submission of all exercises (50% of grade)
    • Practical exercises can be submitted in pairs
  • Passing grade on final exam (50% of grade)

• Web Page
    • Presentations, References, Data, Exercises, etc.
  • Piazza – piazza.com/technion.ac.il/spring2018/236756
    • Q&A, discussions
Course Structure

• Lectures
  • Covers theory and practice of Machine Learning
    • Balance between technical depth and important concepts/ideas
  • The lectures will be self contained but a basic background knowledge in the following topics is required
    • Linear Algebra
      • Matrices, Vector Spaces
    • Basic Probability
      • Random Variables, Distribution Functions, Conditional Distribution, Expectation and Variance

• Exercises
  • A mix of theoretical and practical
    • (only!) Practical exercises can be submitted in pairs
  • The Election Challenge
    • A running practical exercise that follows the basic steps of a methodological model development
    • Implementation using Python
Literature

• Main Reference – One of the following two books
  • "The Elements of Statistical Learning: Data Mining, Inference, and Prediction" – Trevor Hastie, Robert Tibshirani, Jerome Friedman
  • "Pattern Classification" – Richard O. Duda, Peter E. Hart, David G. Stork

• Specific Topic References
  • "Elements of Information Theory" – Thomas M. Cover, Joy a. Thomas
  • Any basic text book on probability and statistics
  • “Understanding Machine Learning” – Shai Shalev-Shwartz, Shai Ben-David
  • "An Introduction to Computational Learning Theory" – Michael J. Kearns
  • "An Introduction to Support Vector Machines and Other Kernel-based Learning Methods" – Nello Cristianini, John Shawe-Taylor

• Generic Reference
  • "Machine Learning" – Tom M. Mitchell
LET’S HAVE SOME FUN