

What you will learn in this course

Mathematical Foundations of Data Analysis and Randomized Algorithms

- Vectors
- Matrices
- Probability
- Random Walks
- Massive data algorithmic: hashing, random projections, sketching, streaming
- Random graphs and random matrices
- Average-case analysis of algorithms

What you will not learn in this course

- Machine Learning Theory
 - Instead, take CS 4780, 4786, 4787, 4789, 6783, etc.
- But we *will* learn several topics relevant to ML theory
 - gradient descent and SGD
 - dimensionality reduction
 - generalization bounds

Prerequisites

- Linear algebra (MATH 2210/2940)
- Probability at least at the level of CS 2800
- Programming at least at the level of CS 2110 (*1110 + asymptotic analysis OK*)
- Recommended but not required:
 - CS 4820
 - Probability at 3000-level or above