



# Randomized Numerical Linear Algebra in Machine Learning

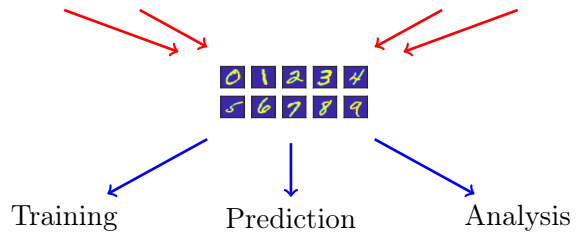
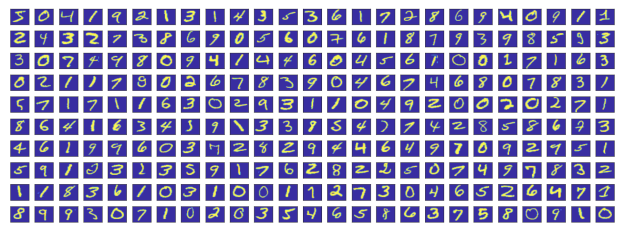
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EECS 598-003 Special Topics, Fall 2022

**Overview:**

Randomized Numerical Linear Algebra (RandNLA) describes a suite of algorithms which use randomness to construct small representations (sketches) of large data matrices. These sketches are then used to efficiently solve large-scale matrix problems at the core of many scientific, data science and machine learning tasks. This course will focus on algorithmic and theoretical foundations of RandNLA, including such topics as randomized dimensionality reduction and approximate matrix multiplication, as well as recent advances in the area with a particular focus on its applications to machine learning.

**RandNLA in ML**



**Prerequisites:** EECS 501 and 551 (or related courses)

**A tentative list of topics:**

Randomized dimensionality reduction, high-dimensional probability, approximate matrix multiplication, sketching for linear regression, importance sampling and subset selection, randomized singular value decomposition, kernel approximation, stochastic methods in second-order optimization