10-606 Mathematical Foundations for Machine Learning

Machine Learning Department School of Computer Science Carnegie Mellon University



Solving Linear Equations with Decompositions

Matt Gormley Lecture 7 September 19, 2018

Reminders

- Homework 1: Linear Algebra
 - Out: Wed, Sep. 12
 - Due: Fri, Sep. 21 at 11:59pm
- Homework 2: Linear Algebra + Calculus
 - Out: Wed, Sep. 12
 - Due: Fri, Sep. 21 at 11:59pm
- Matt's office hours on Thu are cancelled this week

Q&A

LINEAR ALGEBRA

Linear Algebra: Matrices

Chalkboard

- Types of Matrices
 - square matrix
 - diagonal matrix
 - identity matrix
 - symmetric matrix (and the set of symmetric matrices)
 - orthogonal matrix (different than orthogonal vectors!)

- Matrix Operations

- The Transpose
- The Trace
- Inverse
- Determinant

Linear Algebra: Eigenvalues

Chalkboard

- Eigenvalues & eigenvectors
 - Definitions
 - Properties

Linear Algebra: Linear Equations

Chalkboard

- Linear equations (Ax = b)
- Factorizations
- LU Decomposition
- Singular Value Decomposition
- Solving linear equations with factorizations