List of Topics Since Exam 1

- The SVD The SVD depended on "The Spectral Theorem" which said that eigenvalues and eigenvectors of symmetric matrices had special properties. We discussed the regular SVD and the reduced SVD.

  In obtaining the reduced SVD, we need to compute the rank of the matrix, which is sometimes not clearly numerically determined. In that case, we looked at the normalized eigenvalues as a method of determining the dimension in terms of the percent variance captured.

  - The pseudoinverse

- The Best Basis Understand what is meant by "best". Be able to compute the basis vectors.

  - Determine the low dimensional representation, visualize data in the best two dimensinal space.

- Linear Neural Networks

  - Batch training with the pseudoinverse
  - Online training with the Widrow-Hoff algorithm.

- Data Clustering

  - K-means
  - Kohonen's SOM
  - Neural Gas

- Optimization and Linearization.