Learing goals

- Linear algebra, vector-matrix notations: understand the covered material very well
- Linear regression: understand very well
- Gradient descent: understand very well
- Cost function
- Train and test set
- Nearest neighbors algorithm vs. linear algorithms, fully understand the trade-offs
- Curse of dimensionality, elementary calculations: understand very well
- Features, how to convert a nonlinear problem into a linear one: understand very well
- How to determine overfitting by studying the cost on test and train set, as a function on training iteration.
- Spline construction: understand core ideas

Learing goals

- Applications of splines to phoneme recognition example. Enforcing smoothness: understand very well.
- Haar wavelets construction: understand core ideas.
- Sparsity. Why wavelet transform of natural images is sparse: understand very well
- Convexity, distinguish convex problems and convex sets: understand very well
- Dual certificates: understand the key concept very well.
- No need to memorize the compressed sensing proof, but understand the basic steps. Overview of that proof is assumed.
- SVM: understand very well.
- Understand back-propagation algorithm very well.
- Be able to program basic machine learning algorithm in your favorite language.