Machine Learning

Spring 2017

Contact:	Patrick Beukema	**Time:**	W 12:00 – 1:00
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Course Pagse:

1. Course website: http://github.com/pbeukema/ML_CNBC

2. Code referenced in text: http://github.com/probml/pmtk1/tree/master/pmtk/bookCode

Main Text: Machine Learning: A Probabilistic Perpspective. https://www.cs.ubc.ca/ murphyk/MLbook/. Each week we will read, do exercises, and discuss one chapter of this text.

Schedule & Exercises:

1. Introduction 1/11

   - Exercises: 1.1-1.3, Rec: Write KNN from scratch

2. Probability 1/18

   - Exercises: 2.1-2.5, 2.12, Rec: 2.17 (Prove, and also show with simulation)
   - Topics:

3. Generative models for discrete data 1/25

   - Exercises

4. Gaussian models 2/1

   - Exercises

5. Bayesian statistics 2/8

   - Exercises

6. Frequestist statistics 2/15

   - Exercises

7. Linear Regression 2/22

   - Exercises

8. Logistic Regression 3/1

   - Exercises

9. Generalized linaer models and the exponential family 3/8

   - Exercises

10. Directed graphical models 3/15

- Exercises

11. Mixture models and the EM algorithm 3/22

    - Exercises

12. Latent linear models 3/29

    - Exercises

13. Sparse linear models 4/5

    - Exercises

14. Kernels 4/12

    - Exercises

15. Gaussian processes 4/19

    - Exercises

Course objectives: The idea behind this course is to gain exposure and learn the fundamentals of machine learning through weekly discussions and exercises. Secondary goal is to republish the code that is used throughout the text and excersises in the form of jupyter notebooks in python. The motivation is for that is twofold. 1. Current implemntations are in Matlab, which some people lack access to. 2. More learning will happen doing things from scratch.

Prerequisites: Calculus, linear algebra, probability.

Resources & Recommendations:

- Learning python: learnpythonthehardway.org

- Programming: jupyter.org notebooks

- Editor: atom.io