Machine Learning

Spring 2017

Contact:	Patrick Beukema	**Time:**	W 12:00 – 1:00
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Course Page: http://github.com/pbeukema/ML_CNBC

Main Text: Each Week we will read and do exercises from one chapter of Machine Learning: A Probabilistic Perpspective. https://www.cs.ubc.ca/ murphyk/MLbook/

Schedule & Exercises:

1. Introduction

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

2. Probability

   - Excersies: 2.1-2.5, 2.12, Rec: 2.17 (Prove & Run simulation)

3. Generative models for discrete data

   - Excersies

4. Gaussian models

   - Excersies

5. Bayesian statistics

   - Excersies

6. Frequestist statistics

   - Excersies

7. Linear Regression

   - Excersies

8. Logistic Regression

   - Excersies

9. Generalized linaer models and the exponential family

   - Excersies

10. Directed graphical models

    - Excersies

11. Mixture models and the EM algorithm

    - Excersies

12. Latent linear models

   - Excersies

13. Sparse linear models

   - Excersies

14. Kernels

   - Excersies

15. Gaussian processes

   - Excersies

Course objectives: This course is primarily designed for graduate students, and will introduce an audience to the state-of-the-art in modeling techniques for computer science and engineering majors. We try to discuss as many models as possible. We chiefly focus on complex networks, inference, machine learning, and probabilistic/statistical models and methods.

Prerequisites: It will be challenging to follow along without some bacground in calculus, linear algebra, probability and statistics.

Important Dates:

Midterm #1 .... $\bar{\text{A}}$b$\bar{\text{a}}$n 16, 1393 $\equiv$ November 7, 2014
Midterm #2 .... $\bar{\text{A}}$zar 21, 1393 $\equiv$ December 12, 2014
Final Exam .... Dey 18, 1393 $\equiv$ January 8, 2015

Resources & Recommendations:

   - Learning python: Learn Python the Hard Way learnpythonthehardway.org/

   - Programming: Jupyter notebooks jupyter.org

   - Text editor (& Programming): Atom atom.io

   - Github: