



Forecasting Proposal Presentation

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Introduction of Team Members

Brianna Sundberg (Team Lead)

- ▶ Senior in Systems Track

Austin Tasato

- ▶ Senior in Computer Engineering Track

Jaimie Obatake

- ▶ Junior in Systems Track

Gordon Li

- ▶ Junior in EP Track

Project Overview

The forecasting team focuses on analyzing data and using machine learning and other prediction techniques to track trends.

Beginning with raw data, we pre-process it so that the code is able to be passed through various predictive algorithms.

The idea behind weather prediction is that we will one day be able to predict changes in the solar energy produced, and can modify the amount of power the grid draws to maintain a balance of power.

Overview of Goals for Semester

Understand Data

- ▶ Pre/Post-Processing Data
- ▶ Visualize Data
- ▶ Build Model Interpretation Skills
- ▶ Identify Data Trends

Study Machine Learning Algorithms

- ▶ Tools for Learning
- ▶ Online and Offline Algorithms

Produce Code

- ▶ Well-Documented, Readable Code
- ▶ Conceptual (and Math-Related) Notes

Plans to Complete

- ▶ Weekly lessons from Seyyed and Dr. Kuh to learn new concepts & techniques
- ▶ Create documentation for algorithms and concepts to leave for future generations of the forecasting team
- ▶ Create robust functions that can be easily understood and implemented

Potential Problems

- ▶ Ease of documentation with math notation on the Wiki
- ▶ Irregularities in collected data due to intermittence
- ▶ Errors in collected data
- ▶ Bringing new forecasting members up to date with topics & Python
- ▶ Transitioning conceptual techniques to robust code

Learning Goals

Preprocessing / Analysis:

- ▶ Mean Vectors
- ▶ Covariance Matrices
- ▶ Visualize Data (i.e. Graphs)
- ▶ Validation
- ▶ Regularization

Code:

- Increase familiarity with Python
- Function Documentation
- Math Notes
- Working & Well-Commented

Machine Learning Algorithms:

- Feature Extraction
- Clustering
- Principle Component Analysis

- Offline Learning:
 - Linear Regression
 - Least Squares

- Online Learning:
 - Recursive Least Squares
 - Least Mean Square

Team's Progress

Lessons

- ▶ Python Introduction
- ▶ Tap Filters
- ▶ Introduction to Least Squares
- ▶ Basic Normalization Techniques
- ▶ Data Visualization

Any Questions?