Introduction

Goal: Being able to conduct experiments in political science before becoming a graduate student.

Focus: Social Science Research Method and Mathematical Foundation

Math foundations:

1. Convex Optimization
2. Statistics
3. Bayesian Statistics
4. Statistical Learning

Research Method:

1. Deep Learning / Machine Learning
2. Causal Inference
3. Network Analysis
4. Natural Language Processing with Deep Learning

Econ:

1. Macro Economy
2. Monetary Policy

Crude Plan

The plan is divided up into 4 phases.

Phase 1

Course Resources

Convex Optimization

Course Guide: Convex Optimization, Boyd

Course Website: <https://web.stanford.edu/class/ee364a/>

Course Videos: <https://www.youtube.com/playlist?list=PLdrixi40lpQm5ksInXlRon1eRwq_gzIcw>

Learning Method:

1. Understand Slide (by watching the lecture and reading the book)
2. Does homework post on the website

Statistics

Course Guide: Statistics for Applications, Rigollet

Course Website: <https://ocw.mit.edu/courses/mathematics/18-650-statistics-for-applications-fall-2016/assignments/>

Learning Method:

1. Watch the Lecture
2. Do the homework Problems on the website

Bayesian Statistics

Course Guide: Statistical Rethinking, McElreath

Course Video: <https://www.youtube.com/watch?v=4WVelCswXo4&list=PLDcUM9US4XdNM4Edgs7weiyIguLSToZRI>

Learning Method:

1. Watching the Lecture
2. Read the book
3. Do homework problems posted at the end of each chapter

Statistical Learning

Course Guide: Introduction to Statistical Learning

Course Textbook: An Introduction to Statistical Learning with Applications in R

Learning Method:

1. Read the chapter
2. Do the homework problems

Machine Learning

Course Guide: CS229, Ng

Course Website: <http://cs229.stanford.edu/syllabus-autumn2018.html>

Course Video: <https://www.youtube.com/watch?v=jGwO_UgTS7I&list=PLoROMvodv4rMiGQp3WXShtMGgzqpfVfbU&index=1>

Learning Method:

1. Watch the lecture
2. Understand the class note
3. Do the homework

Causal Inference

Course Guide: Causal Inference, Xu

Course Website: <https://xuyiqing.github.io/POLI273/>

Leaning Method:

1. Read the assigned Reading
2. TODO

Network Analysis

Course Guide: Machine Learning with Graphs

Course Website: <http://web.stanford.edu/class/cs224w/>

Course Video: <http://snap.stanford.edu/class/cs224w-videos-2019/>

Learning Method:

1. Watching video lectures
2. Read suggested readings
3. Do Homework (don’t have to finish homework first to move on)

Natural Language Processing

Course Guide: Natural Language Processing with Deep Learning, Manning

Course Website: <https://web.stanford.edu/class/archive/cs/cs224n/cs224n.1194/>

Learning Method:

1. Watching video lectures
2. Read suggested readings
3. Do Homework

Macroeconomics

Course Guide: Khan Academy

Course Website: <https://www.khanacademy.org/economics-finance-domain/macroeconomics>

Learning Method:

1. Go through the course materials

Monetary Policy

Course Guide: Economics of Money and Banking, Mehrling

Course Website: <https://www.coursera.org/learn/money-banking?>

Learning Method:

1. Watch the lecture
2. Do the reading
3. Write down things I learned in discussion