Machine Learning for Humanities
Master of Logic June Project

Course Description: Silvan Hungerbühler

1 Overview

The project aims to give students without backgrounds in computer science the chance to gain concrete skills and experience with Machine Learning. The students following the course will obtain an overview over available techniques as well as hands-on implementation experience by following a Coursera course on the subject by Andrew Ng.

Besides the implemenation assignments throughout the course, each student will hand in a final data analysis project. For this the students will use corpora of philosophical texts provided by Arianna Bettis research group. The projects will be evaluated by and discussed with both Veruska Zamborlini (computer science postdoc on Arianna Betti's team) and Arianna Betti.

The students will work in mostly autonomous fashion as a study group on the Coursera course on Machine Learning and consult with Veruska Zamborlini to discuss technical difficulties if they arise. The project will take the entire month of June 2017.

Workload: 6 EC, 168 hours of work (full month)

2 Syllabus

The following presents an overview over topics and covered over Andrew Ng's Coursera course on Machine Learning:

Time	Topics	Course Chapters
Week 1: 5.6 to 11.6	Single & Multiple Linear Regression Logistic Regression	1,2,3
Week 2: 12.6 to 18.6	Neural Networks: Representation & Learning Support Vector Machines	4,5,6,7
Week 3: 19.6 to 25.6	Unsupervised Learning Dimensionality Reduction Recommender Systems Large Scale ML	8, 9, 10, 11
Week 4: 26.6 to 2.7	Individual Project, **Deadline 2.7**	

The students will do all assignments given in the course. They will try to use Ng's theoretical explanations and algorithmic ideas and implement them in Python. Ng's course is designed for implementation in Matlab. In case some content is unfit for Python altogether, the students will use the following resources:

- The deep learning book: Link to Book
- Patrick Winston's AI lectures, starting with nr 10: Link to Youtube
- Udemi's Machine Learning Course: Link to Course

Individual Project The idea of the final project is to use one or multiple of the methods learned in the first three weeks on data provided by Arianna Betti's research group. Each student will identify a question of interest that is sensibly workable with the data provided, develop/amend code for the task, carry out the analysis and write a short report. The report should be around 2500 words long and contain a description of the question pursued and the methods and the data that were used as well as a presentation and a discussion of the results.

3 Organization

The students will mostly work autonomously and assist each other in processing the course's theoretical content and completing the implementation assignments. They will consult weekly with Veruska Zamborlini to discuss progress and difficulties, either in person or over video calls.

Furthermore, the students will report back with Arianna Betti and/or Veruska Zamborlini on four points in time over the course: Once at the beginning to get to know each other and establish basic formalities, once halfway throughout the course to report on progress and issues that arose, a third time immediately before the last week to discuss project ideas, and a last time around the deadline to talk about results. The tentative dates for these meetings/skype sessions:

1. Meeting: Monday, 7.6.17 (Skype), Arianna Betti & Veruska Zamborlini
2. Meeting: Thursday, 15.6.17, Veruska Zamborlini
3. Meeting: Friday, 23.6.17, Arianna Bettti & Veruska Zamborlini
4. Meeting: Last week of June, ?, Veruska Zamborlini

The students as well as the supervisors will use *Slack* - an online collaboration platform - to discuss and share their work. This is the invitation link to join the working group.
There is a repository on Github to work on the assignments.