

ECE 491/EID 364

Instructors: Sam Keene (EE) and Will Shapiro (Arch)

Course Title: Data Science Projects for Social Good

Course Description: Applications of machine learning, data science and software engineering to projects in the areas of education, equality, justice, health, public safety, economic development or other areas. Projects will be done in collaboration with external partners, and will be focused on solving problems with an emphasis on the greater New York City Area. Students will work with the external partners to specify problems and investigate possible solutions. Students will work between disciplines to develop new machine learning based solutions. Additionally, students will work collaboratively to visually convey the insights and results generated. There will be additional requirements for graduate level engineering credit, specifically, the implementation of a machine learning system.

Pre-requisites for ECE 4xx: Students wishing to take the course for graduate level ECE 4xx credit must have completed a prior course on machine learning and permission of instructor required.

Pre-requisites for EID 364: Upper class Art or Architect student with permission of instructor. Engineers will not be permitted to register for this class under EID 364.

Course Projects/Deliverables:

Exploratory Data Analysis: Students must perform an exhaustive exploration of the data set(s) relevant to their project. The result must be presented in either poster, website, interactive demo, or other appropriate format.

Solution Proposal: Students must investigate and propose a solution to their problem. A formal presentation must be made by mid semester to the class, project partners and other interested parties. A document describing the proposed solution will additionally be required.

Final project: A fully functional solution must be implemented, with an accompanying paper describing the methods investigated, the particular solution chosen and the results. A final presentation must be made to the class, project partners and other invited guests. Additionally, an exhibit illustrating the project, demonstrating how it is relevant to the city of New York, and the impact of the solution must be designed and staged for either the end of year show, or a stand alone exhibition.

Possible Partners and Projects (as of 11/10/2017)

City Harvest: Understanding food insecurity in New York City.

Coalition for the Homeless: Eviction Prevention

Data and Society: Mining data from twitter/reddit to understand the impact of propaganda on political discourse

Center for Employment, and Fortune Society: Predicting recidivism.

SingleStop: Data Mining to better understand who needs city services and who is denied these services

Will Shapiro: Architecture corpus

Sanctuary: Text clustering the stories of undocumented persons

Gehl Studios: Knowledge discovery for better understanding and usage of public spaces

Advisory Board: Many alumni and other interested parties with expertise in software design and data science have expressed interest in advising these projects. They will be invited to attend class and deliver guest lectures and/or offer feedback on projects over the course of the semester.

Neema Aggarwal and Jiyu Lin, Consultants, Boston Consulting Group

Christopher Curro, Data Scientist, Gilt

Neba Noyan, Director of Information Design, Center for Innovation through Data Intelligence

Anand Babu, COO, Sidewalk Labs

David Katz, Software Engineer, Sidewalk Labs

Julia Astraukas, Senior C++ Engineer, Spotify