EN.605.634 - Crowdsourcing and Human Computation

Crowdsourcing and human computation reverses the typical approach to computing. Rather than using computers to conduct computation that is too difficult for a human, many humans are used to conduct computation that is too difficult for a computer. This course explores computer science topics that lie at the intersection of data science and social psychology. Topics include crowdsourcing, social media, social network analysis, games, gamification, ubiquitous computing, and computer supported cooperative work. Laboratory exercises will involve hands-on data collection and analysis, to include Amazon Mechanical Turk, and require programming in R or Python, depending upon student preference/proficiency.

Module	Topics	Assignments
Module 1	Intro to Social Computing--connecting people through technology • Social media and other tools that enable interaction • Computer supported cooperative work • Collecting social media data	• One page reflection
Module 2	Social Network Analysis (SNA) • Measures of centrality, opinion leadership • Community detection, clustering, segmentation interventions • Six social forces	• Assignment: calculate SNA measures; cluster network subgroups; statistically test for social forces
Module 3	Social Media • Firestorms/platform manipulation • Collective intelligence • Data scraping	• Assignment: scrape social media data; analyze a social media firestorm data set; draw conclusions
Module 4	Network Conformity and Fake News • Network conformity • Majority illusion • Influence and persuasion	• One page reflection
Module 5	Machine Learning • Supervised learning • Training data • ML performance	• Assignment: Construct three different ML classifiers and compare their performance. Calculate ML performance metrics by hand.
Module 6	Crowdsourcing • History of crowdsourcing • Crowd work • Design principles • Mechanical Turk	• One page reflection

Module	Topics	Assignments
Module 7	Platforms • Overview of platforms • Mechanical Turk • Data collection	• Assignment: Design an AMT study, collect data, present topline analysis
Module 8	Inter-annotator Agreement (IAA) • Measuring consistency • Crowdsourcing data analysis	• Assignment: Calculate the IAA of several data sets using multiple IAA measures. Validate software implementation by hand.
Module 9	Crowdsourcing and Machine Learning • Boosting ML performance with improved crowd design	• Assignment: Improve upon the consistency of crowdsourced data for ML and contrast performance differences. • Final Project Proposal
Module 10	Building a classifier • Improve classifier performance using crowdsourcing	• Assignment: Construct an ML classifier using crowdsourced data.
Module 11	Introduction to chatbots • History and uses • Chatbot mechanics	• One page reflection
Module 12	Make your own chatbot • Construct individual chatbots using crowdsourced data	• Assignment: Construct a chatbot
Module 13	Games and gamification • History and uses • Design principles	• One page reflection
Module 14	Final paper and project presentation • Complete a final paper • Present findings to the class	• Final paper: Write an academic paper of 4-8 pages in length for submission to a peer-reviewed ACM/IEEE conference. • Final presentation: Present findings to the class

Grading

10% Discussion/Participation
20% One Page Reflections
50% Assignments
20% Final Project/Paper
30% Final Project/Paper