Student Poster Session Abstracts

March 8, 2021

Title: Analysis of Abortion Rights Fund of Western Massachussets Data

Author(s): **Natalia Iannucci**, Eunice Kim, Dianne Caravela, Claire Bunn

Abstract: The Abortion Rights Fund of Western Massachussetts provides funding to individuals who are in need of financial assistance for an abortion. Through the Data Science Corps program, we were provided with completely anonymized data from the Fund to provide them with insight about their clients to help them better prepare for their spring strategic planning. We conducted analyses of financial information for the Fund to allow them to better understand the pledges they are making and incorporate these findings into their planning. Finally, we analyzed 2020 data to understand the impact of COVID-19 on the fund's clients and financial impacts this may have on pledges provided by the Fund. We found the Fund works with more clients in Western Massachusetts than in any other location within or outside of Massachusetts. In general, the number of clients was greater for counties with lower average family income, suggesting more individuals requiring financial assistance. The majority of clients are in their first trimester, with fewer clients in their second trimester and few in their third. However, during the pandemic, the average gestational age of clients increased. The average pledge amount also increased during COVID, perhaps due to the increase in average gestational age.

Title: System Identification Through Lipschitz Regularized Deep Neural Networks

Author(s): **Elisa Negrini**, Giovanna Citti, Luca Capogn

Abstract: In this work we use neural networks to learn governing equations from data. Specifically, we reconstruct the right-hand side of a system of ODEs $x'(t) = f(t, x(t))$ directly from observed uniformly time-sampled data using a neural network. In contrast with other neural network-based approaches to this problem, we add a Lipschitz regularization term to our loss function. In the synthetic examples we observed empirically that this regularization results in a smoother approximating function and better generalization properties when compared with non-regularized models, both on trajectory and non-trajectory data, especially in presence of noise. In contrast with sparse regression approaches, since neural networks are universal approximators, we do not need any prior knowledge on the ODE system. Since the model is applied component wise, it can handle systems of any dimension, making it usable for real-world data.

Title: Transparency in digital political ad? Studying psychological bias and public behaviour using NLP

Author(s): **Farzana Patel**

Abstract: Political campaigns are increasingly carried out online, giving activists new opportunities to target and personalize campaign materials for different audiences. This has changed the information landscape, affecting the democratic ideal of an informed population. Therefore, decision-makers have argued that voters must receive additional information through transparent disclosures, where I found this research idea fits well.

I proposed a potential bias impacting the public with underlying consequences. That led me to research NLP techniques that can be potentially implemented in psychological research to further analyse impacts of political adverts. Furthermore, topic models in combination of psychology and NLP techniques were next point of research study.

There is growing research bridging psychology and NLP technique implementations. The main topic of research came to be analysing impact of political adverts using NLP models. From preliminary research, I could find that there is limitation of number of datasets to evaluate the impact of ads on the population in a purely psychological research. Whereas, in an entirely computational research only surfaced on the identification of certain polarity or emotion in the dataset. There is a gap of combining the two to find a quantifiable result in order to help demystify the murky nature microtargeted ads and its efficacy lack thereof which impedes the policy makers to form effective regulations.

Title: Stereotype Threat Study on Mobile Application

Author(s): **Miranda Reisch**, ML Tlachac

Abstract: Mobile screening of mental illness is important in order to address the challenge of ensuring everyone can receive help. The problem, however, is that there could be elements of the mobile application that may influence how people fill out the survey. The purpose of this study was to address a situational predicament called Stereotype Threat, which is when the reminder of a stereotype about a group the person identifies with influences how they complete survey questions. Thus, some participants were shown the statement and asked a demographic question to trigger stereotype threat before completing the mental illness screening surveys. The secondary aims of this study were to determine how much participants would need to be paid to share their text message content and if participants answered interview questions on an application the same way they would in person. Participants were given one of three versions related to payment to share their text message content. The participants were also asked to record themselves answering two open response questions. This study is important in order to optimize the phone application for collecting data that can be analyzed to predict depression and anxiety.

Title: Student Depression Dataset Collection

Author(s): **Rimsha Kayastha**, Veronica Melican, Connor Bruneau, Hunter Caouette, Miranda Reisch, Nina Taurich, Josh Lovering, ML Tlachac, Ermal Toto, Elke Rundensteiner

Abstract: Depression is a serious mood disorder prevalent in young adults aged 18-25 years, among 8.3 percent of whom have had serious thoughts about suicide. Due to the social stigmas around depression and lack of awareness regarding its symptoms, many young adults with depression remain undiagnosed. Depression is commonly screened for by surveys that are perceived as intrusive. Our aim is to develop an unobtrusive screening technology to replace such traditional screening surveys. Thus, we developed Emotivo mobile and website apps that collect depression screening survey responses, demographics, prompted textual answers, audio recordings, social media, and mobile sensor data. These apps were deployed from August 2020 to January 2021 to collect data from 300+ college students. We plan to use this data to train machine learning models to detect symptoms of depression and suicidal ideation in students.

Title: Generating Conditional Text Messages based on Depression

Author(s): **Kratika Agrawal**, ML Tlachac, Elke Rundensteiner

Abstract: Depression is identified as a leading cause of disability and can lead to suicide if left untreated; however, it is difficult to diagnose if someone is depressed enough to need a treatment and thus, it becomes important to devise a method that can fairly detect if a person is suffering from depression.

With text messages being one of the major forms of communication in this era, it makes sense to monitor text messages for depression detection. Though, this task seems quite straightforward, we face the challenge in having access to enough data to perform effective study on it.

Our goal is to generate a large corpus of text messages conditioned as depressed or not depressed. For this, we have conditioned the Sequence GAN (seqGAN) model which is a Generative Adversarial Network that is efficient in generating pragmatic data using adversarial training between a generator and a discriminator.