Mental Health Risk Detection With Artificial Intelligence

Lim, Alexander (School: International School of Beaverton)
Lim, Irene (School: International School of Beaverton)

Mental health challenges, especially depression, are a major issue that impacts people globally. Combined with the prevalent use of social media, this issue is amplified and needs to be mitigated. With advancements in artificial intelligence, this project leverages social media's pervasiveness as a platform to detect depression risks. It addresses the question if depression can be accurately detected on social media. Previous research focused primarily on machine learning techniques but oftentimes are overly complicated and, more importantly, lack perspectives from behavioral science. To overcome these limitations, this project focused on careful data selection and preparation and development of a measurement system to detect depression and evaluate effectiveness. Data from a peer-reviewed conference was processed through a linguistic processing tool to extract features from social media texts, and different variables were tested to determine their impact on detection accuracy. Three machine learning models are used for detection, and the results are evaluated based on confusion matrix criteria. The results concluded that overall accuracy of over 80% was attainable and consistent across different amounts of data, model types, and the number of features. For this sample, the RFC (Random Forest Classifier) and CNN (Convolutional Neural Network Classifier) models detected or predicted the most depressed users (=33,000 of 100,000 depressed users) within 2 seconds of compute time. This supports the hypothesis that social media can be a platform for depression detection, and potentially improve the lives of thousands of undiagnosed people. It is a cost-effective and accessible method to identify at-risk users hidden in plain sight.

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