Anxi: A Novel Natural Language Processing System for the Detection and Prevention of Anxiety Disorders

Somani, Pranav (School: College Park High School)

An estimated 31.1% of all adults will experience an anxiety disorder in their lifetime, yet mental health diagnostic and intervention tools remain largely inaccessible, unaffordable, and culturally stigmatized. To address this unmet need, an accessible and affordable diagnostic and assistive system was created through the development of two machine learning models and a mobile application. The first model, Anxi, is a fine-tuned version of GPT-4 that integrates core principles of cognitive behavioral therapy and mindfulness to identify and correct negative thought patterns related to anxiety. Using natural language processing, the second machine learning model analyzes conversations between users and Anxi to track anxiety levels over time with 96% accuracy. The system then stores this information in a retrievable database accessible to healthcare providers, facilitating more informed treatment plans, monitoring of patient progress, and data-driven decision-making. The mobile application graphically represents this tracked information, while periodically sending notifications encouraging users to check in and converse with Anxi, enabling users to monitor and manage their mental health. This system was deemed successful as it encompasses easily accessible diagnostic and assistive tools that have the potential to address other mental health disorders faced by over 450 million people worldwide.

Awards Won:
Second Award of $2,000