

Thesis Project Portfolio

Harnessing Artificial Intelligence

(Technical Report)

The Impact of the Marcus Chatbot on Mental Health Screening and Support in College Students

(STS Research Paper)

An Undergraduate Thesis

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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EXECUTIVE SUMMARY

In an era marked by escalating mental health concerns, the intersection of technology and society presents novel opportunities and profound challenges. My technical research report focuses on the development and implications of the Marcus chatbot, an AI-driven tool designed to revolutionize preliminary mental health screening. The aim of this research is to address the pressing need for scalable and accessible mental health screening methods. Concurrently, my STS research paper investigates the comparative efficacy of AI-driven tools versus human-performed diagnoses in depression detection and explores the ethical, societal, and clinical implications of AI integration in mental health care. Despite initially seeming disconnected, both research projects converge on the critical exploration of AI's role in enhancing mental health care, underscoring the evolving landscape of technology's impact on society.

My technical research report aims to address the pressing need for scalable and accessible mental health screening methods by introducing the Marcus chatbot. Leveraging sophisticated algorithms, natural language processing, and adaptive learning, Marcus offers personalized and empathetic interactions and bridges the gap between demand for mental health services and available resources. The report outlines the development process, technical capabilities and challenges faced in ensuring Marcus's integration into existing healthcare frameworks.

The findings of my technical research reveal Marcus's significant potential to revolutionize mental health screening. Drawing upon the insights from the research conducted by Oehler et al. (2020), Marcus demonstrates promising results in providing accessible and personalized mental health assessments. Moreover, the study by Hartmann et al. (2019) sheds light on the importance of addressing algorithmic biases to ensure the reliability of AI-driven tools like Marcus. Through the integration of diverse data sets and inclusive programming, as suggested by Qasrawi et al. (2022), Marcus strives to mitigate biases and promote inclusivity in mental health care. Additionally, the research by He et al. (2022) emphasizes the critical role of data privacy and ethical considerations in the development of AI-driven tools. By synthesizing these findings, Marcus not only showcases technical innovation but also exemplifies a conscientious approach towards addressing ethical concerns, thereby paving the way for more accessible and accurate mental health services.

My STS research paper delves into the comparative efficacy of AI-driven tools and human-performed diagnoses in depression detection, examining the ethical, societal, and clinical implications of AI integration in mental health care. Through quantitative analysis and qualitative insights, the research evaluates AI diagnostic accuracy, patient and healthcare provider perspectives and algorithmic biases. By navigating the complex interplay between AI advancements and ethical considerations, the paper seeks to display a course for the responsible integration of AI into mental health services.

The synthesis of my technical and STS research underscores the importance of balancing technical innovation with ethical, societal, and clinical considerations in the development and deployment of AI-driven tools in mental health care. By addressing the challenges and opportunities presented by AI integration, my research contributes to a deeper understanding of technology's role in enhancing mental health care while advocating for an ethical framework that prioritizes human well being.