Development of an AI-Integrated Online Counseling and Self-Improvement Platform for Mental Health Support

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I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science.

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DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Sri Lanka Institute of Information Technology or to any other institution for assessment for any other purpose.

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ABSTRACT

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Mental health challenges such as stress and anxiety remain a growing global concern, particularly in low-resource settings like Sri Lanka, where access to professional counseling is limited and stigma discourages many individuals from seeking support. This thesis presents the development of an offline AI-based counseling chatbot designed to provide accessible, empathetic, and private mental health support without relying on high-bandwidth internet connections. The system was implemented using a TF-IDF-based natural language processing pipeline to classify user inputs into predefined intent categories and deliver evidence-based therapeutic responses. Training data were compiled from clinical counseling transcripts, standardized affective word databases, anonymized peer support forums, and publicly available datasets, ensuring both linguistic diversity and clinical relevance. Evaluation of the system demonstrated an intent detection accuracy of 91.2% across 387 test queries. A preliminary user study involving 10 participants revealed that 80% reported noticeable stress reduction after interaction, while responses were rated at an average of 4.3/5 for relevance. The chatbot maintained a lightweight design with an average response time of 0.19 seconds and a memory footprint of just 2MB, enabling reliable operation on low-end devices in offline settings. The findings confirm that simple, transparent AI techniques can effectively bridge treatment gaps in underserved regions. While the current system is English-only, future enhancements will focus on incorporating multilingual support, contextual emotion analysis, and improved personalization, providing a scalable and culturally adaptive solution for equitable mental health care.

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