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Multimodal Emotion-Aware Conversational Agent for Mental Health Support Using Deep Learning and Generative AI

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Abstract: *Mental health concerns affect individuals across all ages, yet many people hesitate to seek help due to stigma, limited access to professionals, or fear of judgement. Although AI-driven chatbots offer a convenient way to provide support, most systems rely only on text, making their emotional understanding narrow and often inaccurate. This dissertation proposes a Multimodal Emotion-Aware Conversational Agent (MEACA) that interprets emotions using three complementary modalities—text, facial cues, and physiological signals. Text understanding is handled using transformer-based language models; facial emotions are detected with Vision Transformers; and physiological signals are interpreted using BiLSTM architectures. A cross-attention fusion layer integrates these signals, and a generative model produces emotionally aligned responses. Experiments on datasets like GoEmotions, AffectNet, and K-EmoCon demonstrate improved emotion recognition and more empathetic interactions. The model aims to offer a practical, accessible tool that can support mental health care more effectively than text-only systems*

Keywords: Multimodal Emotion Recognition, Generative AI, Affective Computing, Emotion-Aware Conversational Agent.