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TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS

MIT-WPU

DEPARTMENT OF COMPUTER ENGINEERING AND TECHNOLOGY

BTech Capstone Project Academic Year 2024-25

- Title of the Project:Depression detection using python & web development
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Category of the Project: In-House

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❖ *Summary of Work:*

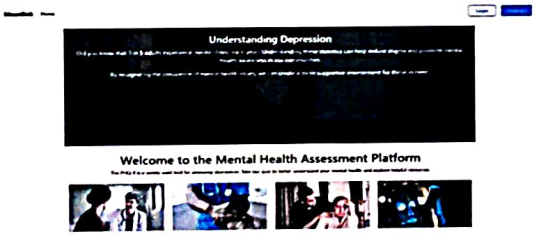
Abstract: Depression affects over 300 million people globally, making it a leading cause of disability. Early detection is critical for timely intervention, but current diagnostic methods face challenges like limited access and potential biases. This study introduces a dual-method system combining psychological evaluations and facial analysis using Naive Bayes classifiers and convolutional neural networks (CNNs). It identifies patterns linked to mental health disorders, providing clinicians with an objective, comprehensive diagnostic tool. Scalable and user-friendly, the system ensures privacy, supports underserved areas, and enhances accessibility in clinical and remote settings. This approach aims to revolutionize mental health diagnosis and treatment.

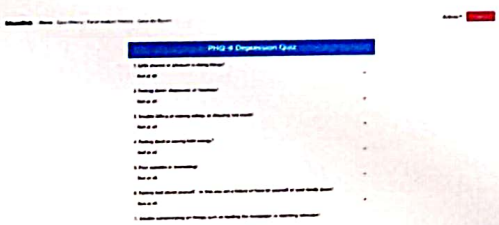
Objectives:

- **Early Detection:** Combine individual quizzes and real-time facial expression analysis to identify early signs of depression.
- **Disorder Differentiation:** Distinguish between various types of depression, including anxiety, PTSD, and bipolar disorder, with customized recommendations.
- **Real-Time Analysis**: Use CNNs for video-based facial expression recognition to assess emotional states effectively.
- **Accessibility:** Provide an intuitive, user-friendly interface with immediate feedback and treatment suggestions for users of all technical skill levels.

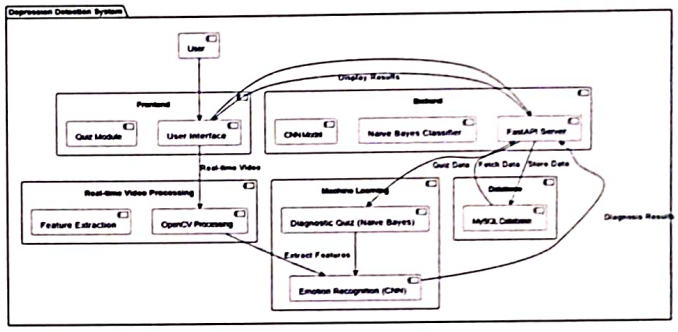
Result and Analysis:

The Depression Detection System combines Naive Bayes for quizzes and CNNs for facial analysis, achieving 95.45% and 66.04% accuracy, respectively. Using weighted results, it enhances diagnosis speed and accuracy, paving the way for AI-driven mental health solutions.





System Architecture:



The diagram illustrates the architecture of a Depression Detection System. It integrates a frontend for user interaction (quiz module and real-time video input) with backend components like CNN models, Naive Bayes classifiers, and a FastAPI server. Real-time video processing (OpenCV) and a MySQL database support emotion recognition and data storage for diagnosis results.

Conclusion:

The Depression Detection System leverages AI to transform mental health diagnostics by combining psychological assessments with real-time physiological data analysis. It integrates a Naive Bayes classifier to analyze quiz responses, calculating probabilities for conditions like anxiety, PTSD, and bipolar disorder. A Convolutional Neural Network (CNN) enhances the system by detecting subtle emotional patterns through facial expression analysis in real-time. This user-friendly system delivers accurate, rapid, and data-driven insights, bridging self-evaluation with objective observation. Rigorous testing highlights its reliability and practical utility for individuals and professionals. This innovative approach makes early depression detection accessible, empowering proactive mental health management and treatment.