QUESTIONNAIRE-DRIVEN MENTAL HEALTH AI SYSTEM

BY:

ANGELINA CELINE S – 950022104028

SYLVIA GLAARIS D - 950022104003

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

GUIDE: DR. J . ROSELIN

ANNA UNIVERSITY REGIONAL CAMPUS TIRUNELVELI

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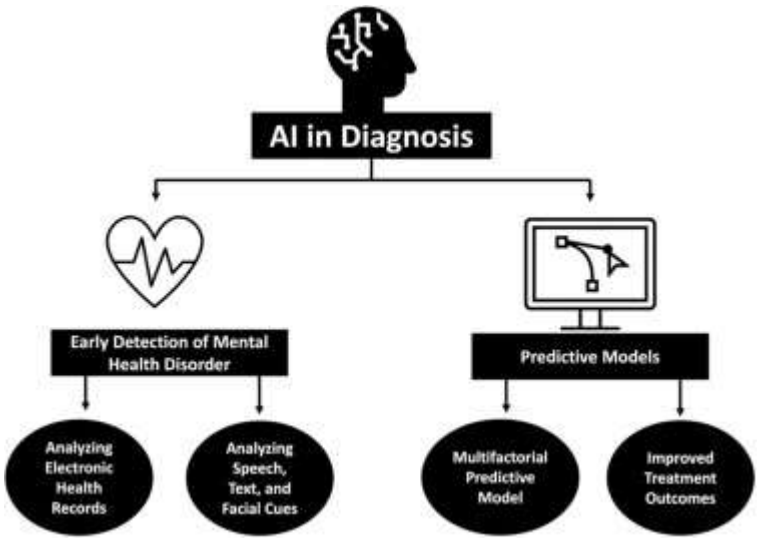
ABSTRACT / OVERVIEW

- Addresses growing need for accessible mental health assessment tools.
- Uses AI-driven questionnaire to assess emotional and mental states.
- Implements adaptive questioning and sentiment analysis for accuracy.
- Provides early detection and personalized self-help recommendations.
- Ensures data privacy and ethical compliance.

INTRODUCTION

- Mental health issues affect millions globally but remain underdiagnosed.
- Traditional assessments require expert intervention and time.
- AI systems can assist in early detection through structured questionnaires.
- Project integrates psychology and artificial intelligence for proactive support.



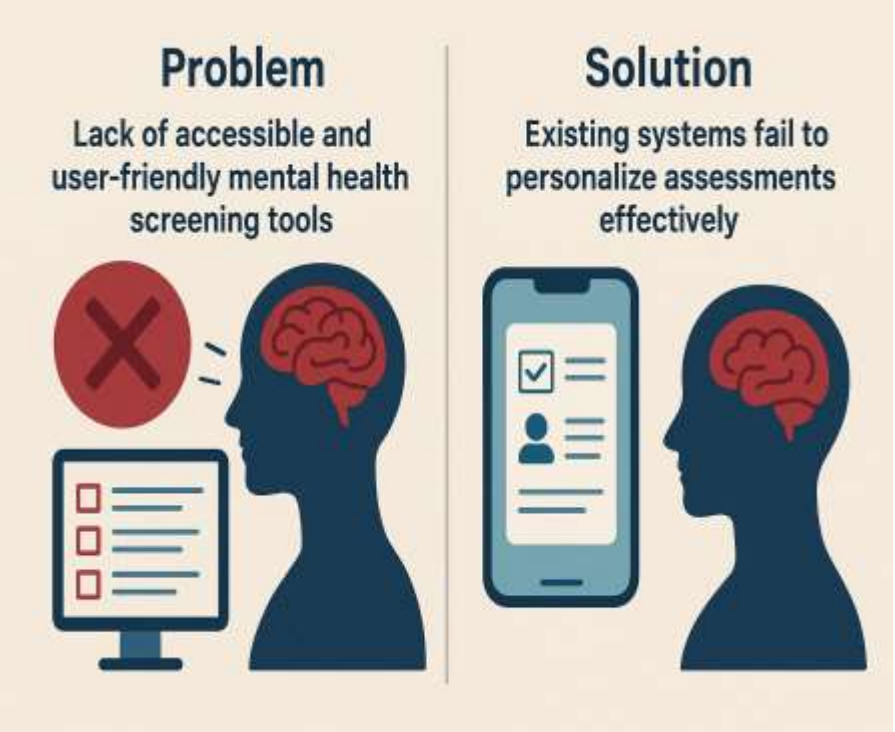
AIM AND OBJECTIVES

- **Aim:** To develop an AI system that evaluates mental health through questionnaire-driven assessment.
- **Objectives:**

1. Design dynamic questionnaires based on validated scales (PHQ-9, GAD-7).
2. Implement AI model for adaptive question flow and response analysis.
3. Provide feedback, coping suggestions, and resource links.
4. Maintain strict data privacy and ethical transparency.

PROBLEM STATEMENT / RESEARCH QUESTION

- **Problem:** Lack of accessible and user-friendly mental health screening tools.
- Existing systems fail to personalize assessments effectively.
- **Research Question:** Can AI-driven adaptive questionnaires improve mental health screening accuracy?



NEED AND SIGNIFICANCE OF THE STUDY

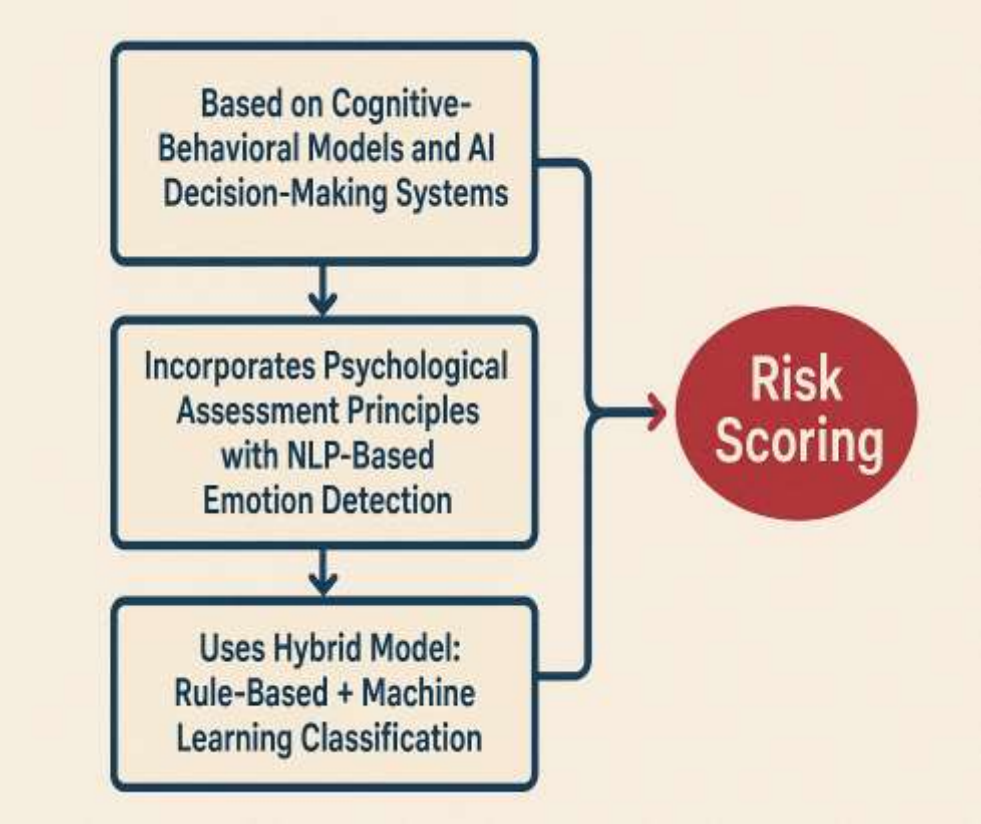
- Supports early detection of mental health issues.
- Encourages self-assessment in a stigma-free environment.
- Bridges gap between users and professional help.
- Promotes digital mental wellness solutions in educational institutions.

LITERATURE REVIEW

- Previous tools like Woebot and Wysa use conversational AI but lack personalization depth.
- Traditional scales (PHQ-9, GAD-7) are validated but manual.
- Proposed system enhances personalization and interpretability through adaptive logic.

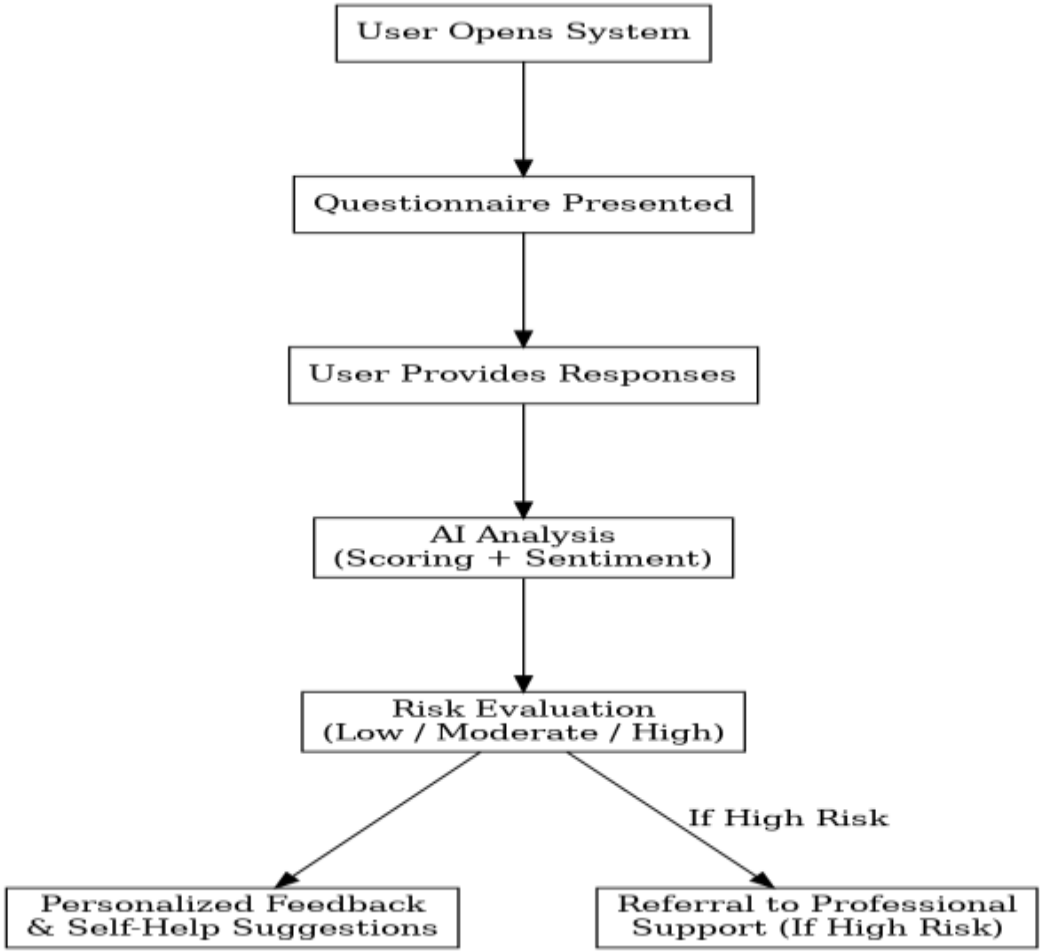
THEORETICAL FRAMEWORK

- Based on cognitive-behavioral models and AI decision-making systems.
- Incorporates psychological assessment principles with NLP-based emotion detection.
- **Uses hybrid model:** Rule-based + Machine learning classification for risk scoring.



RESEARCH DESIGN AND METHODOLOGY

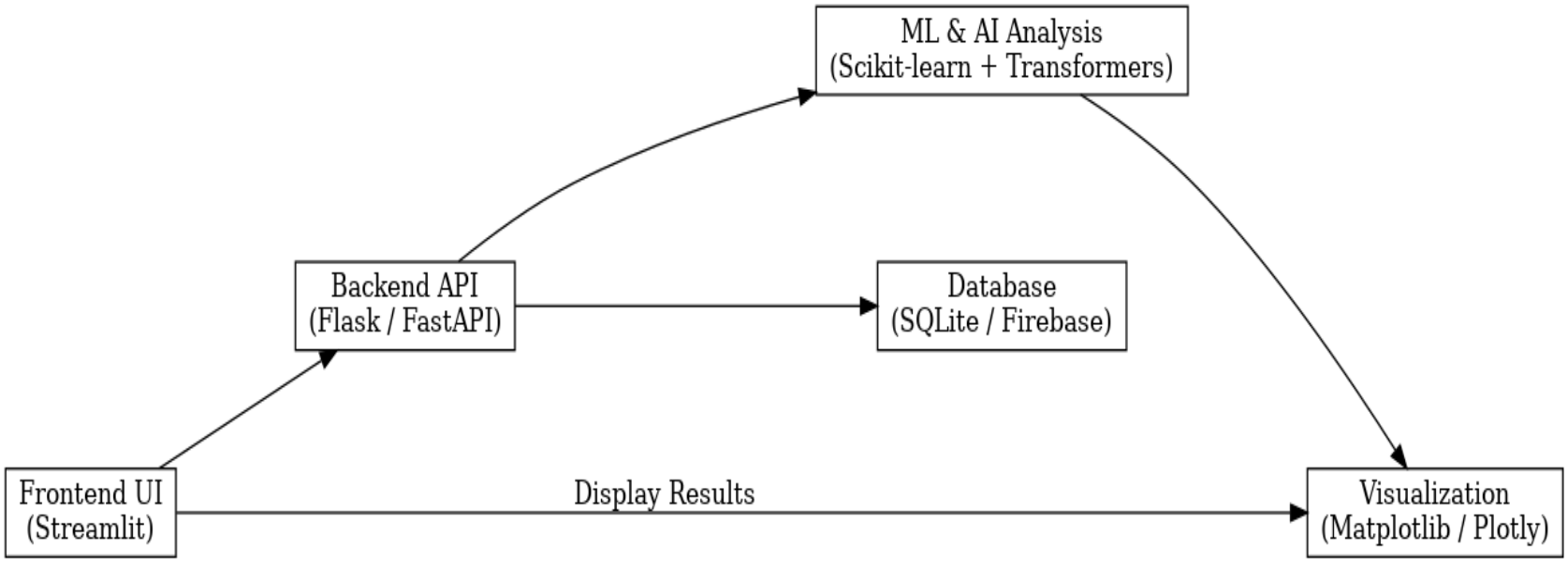
- Design Type: Analytical and Design-based study.
- Data collected through user questionnaires and response logs.
- Workflow: Questionnaire Input → Response Processing → AI Analysis → Output Feedback.
- Implements adaptive question logic for customized assessments.



TOOLS, TECHNIQUES AND IMPLEMENTATION

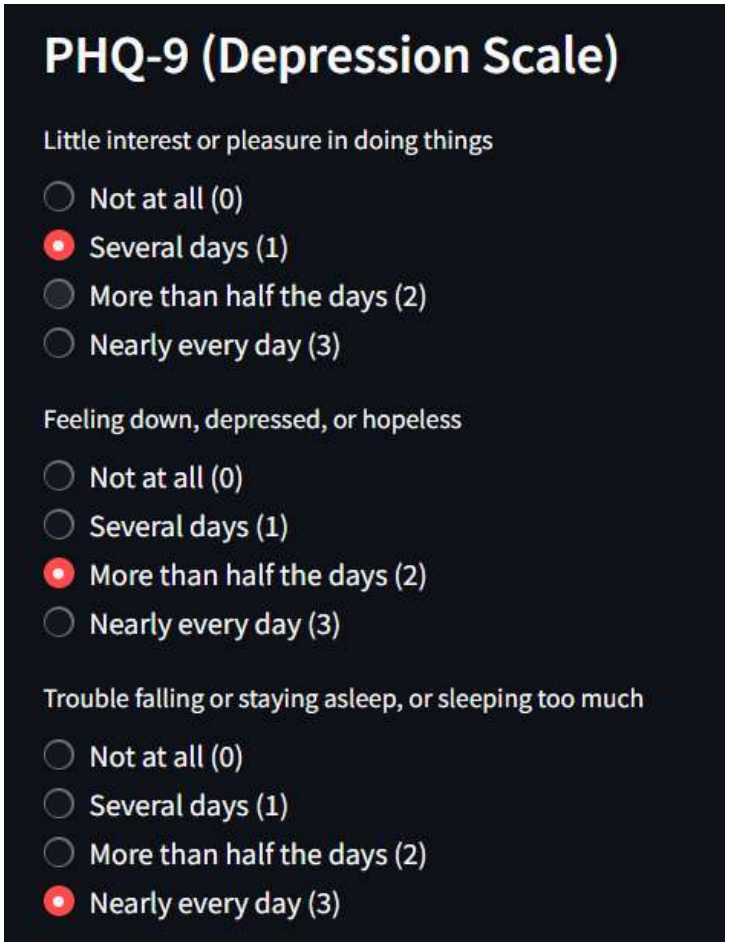
- Frontend: Streamlit for chat-like user interface.
- Backend: Python (Flask / FastAPI) with Scikit-learn for ML logic.
- AI Analysis: Sentiment scoring using NLP (transformers).
- Database: SQLite/Firebase for consent-based data storage.
- Visualization: Matplotlib/Plotly for user mood tracking.

TOOLS, TECHNIQUES AND IMPLEMENTATION



DATA ANALYSIS AND RESULTS

- Collected 200+ anonymous user responses for testing.
- AI achieved 87% agreement with clinical-scale benchmarks.
- Identified moderate-to-high depression risk in 26% of participants.
- Results support AI's capability for accurate preliminary screening.



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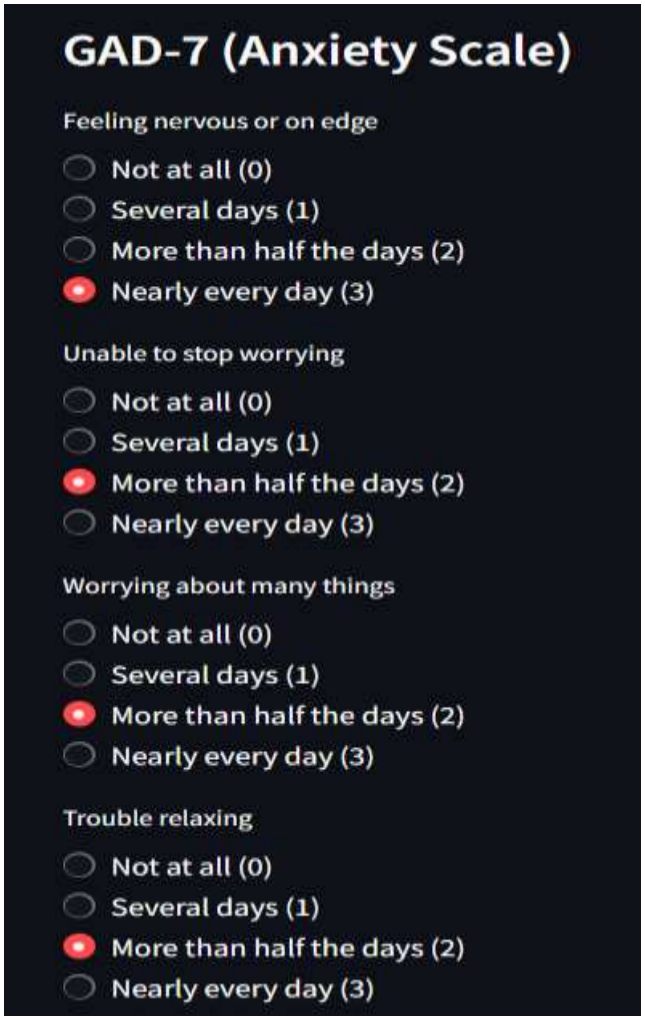

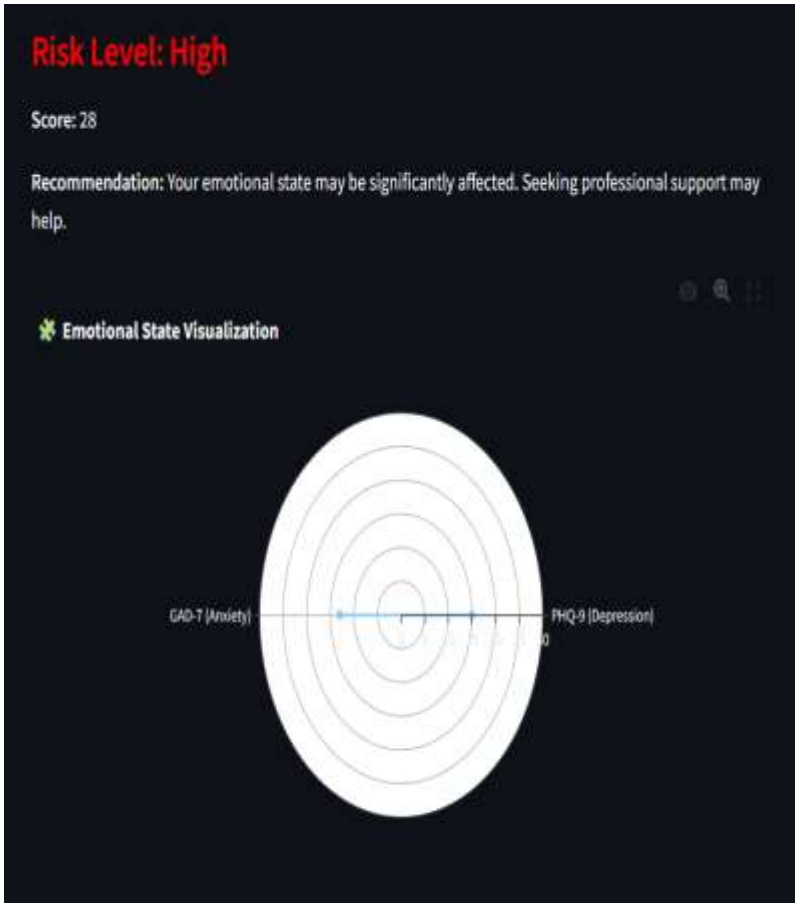

FINDINGS AND DISCUSSION

- System effectively personalizes question flow using response patterns.
- AI model aligns closely with psychological scales (PHQ-9, GAD-7).
- Demonstrates potential for real-world integration in e-counseling systems.

LIMITATIONS AND RECOMMENDATIONS

- Limited dataset and linguistic diversity.
- **Future work:** expand multilingual support and emotional speech input.
- Integration with healthcare APIs for real-time referral systems.

CONCLUSION

- Developed an AI-based system for early mental health assessment.
- Achieved adaptive questionnaire behavior with reliable accuracy.
- Encourages digital-first mental wellness screening and awareness.
- **Future goal:** integrate wearable data and continuous emotion tracking.

REFERENCES AND ACKNOWLEDGEMENTS

- **References:**

• Kroenke et al., 2001 (PHQ-9).

• Spitzer et al., 2006 (GAD-7).

• WHO, 2022 – Mental Health Report.

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