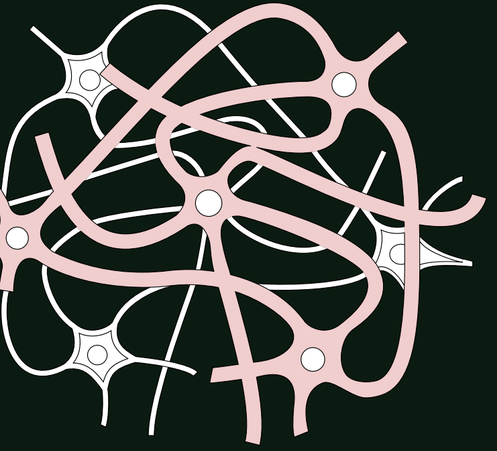
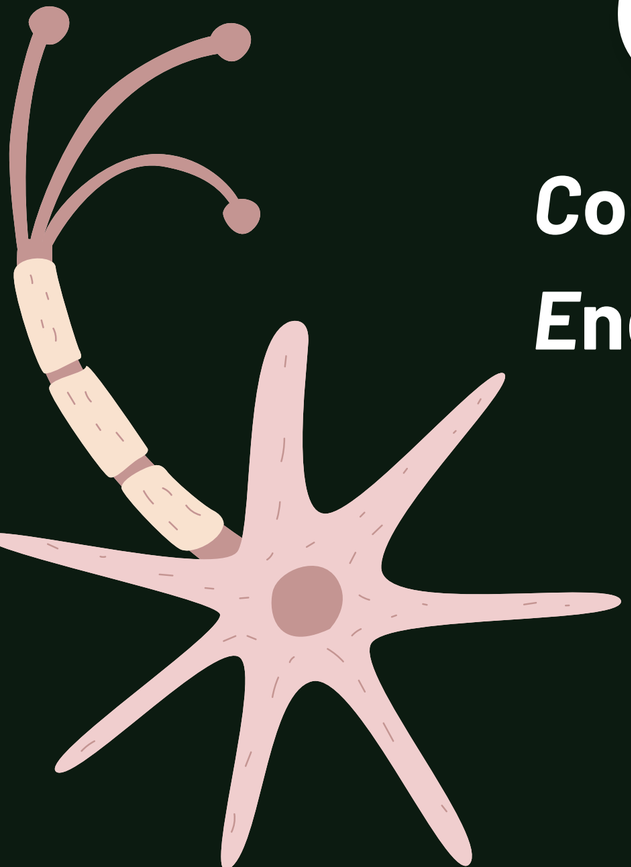
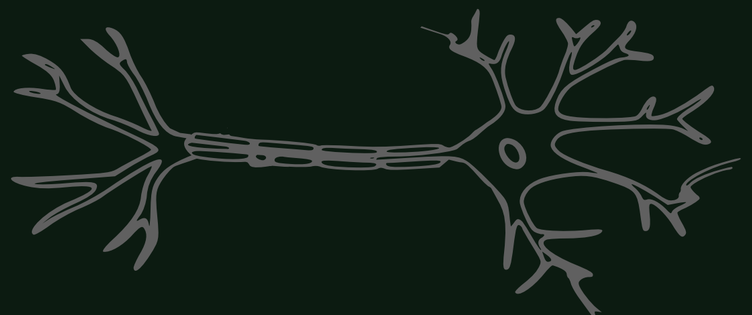
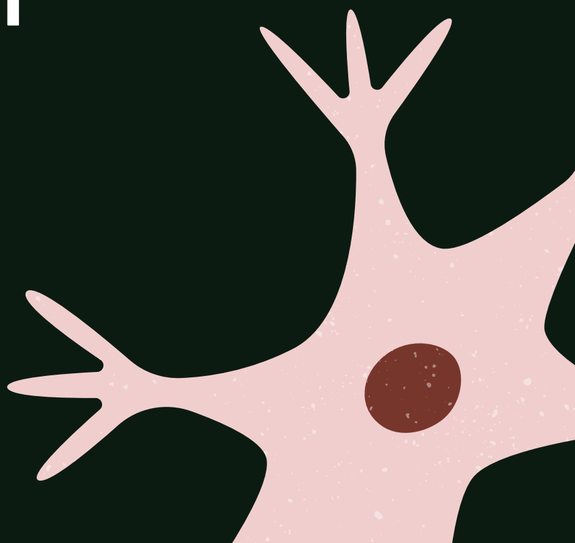


CORTEXA AI

Cognitive Observation & Risk Tracking Engine for Exploratory Analysis using AI

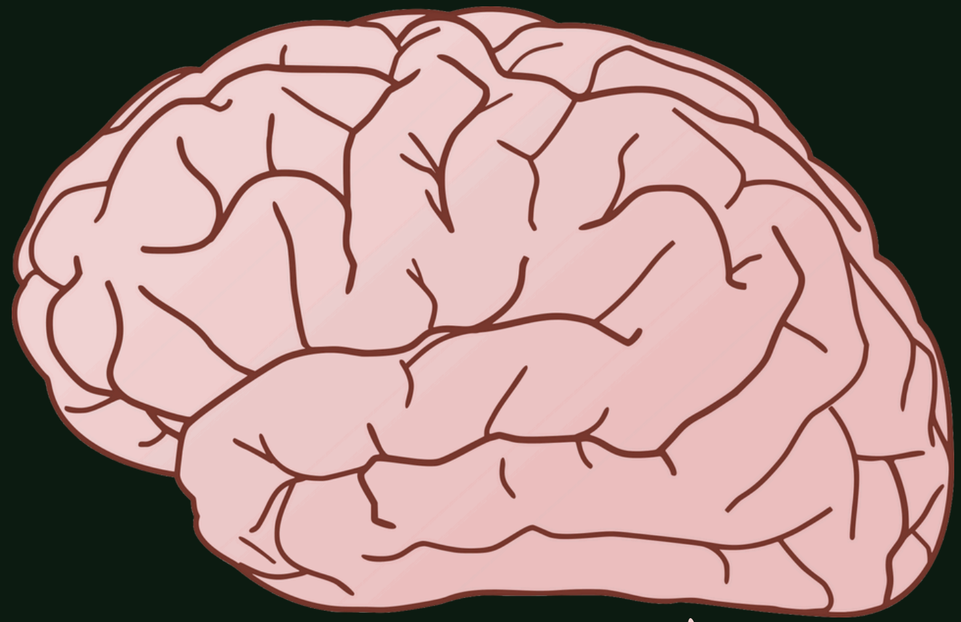






Problem Statement

- *Neurological disorders are often detected at later stages.*
- *Lifestyle and behavioral data are rarely used for early risk prediction.*
- *Existing systems lack personalized, AI-driven neurological risk assessment.*



Methodology

START

User Input (Mood, Sleep, Diet, Activity)

Data Processing (Preprocessing & Scoring)

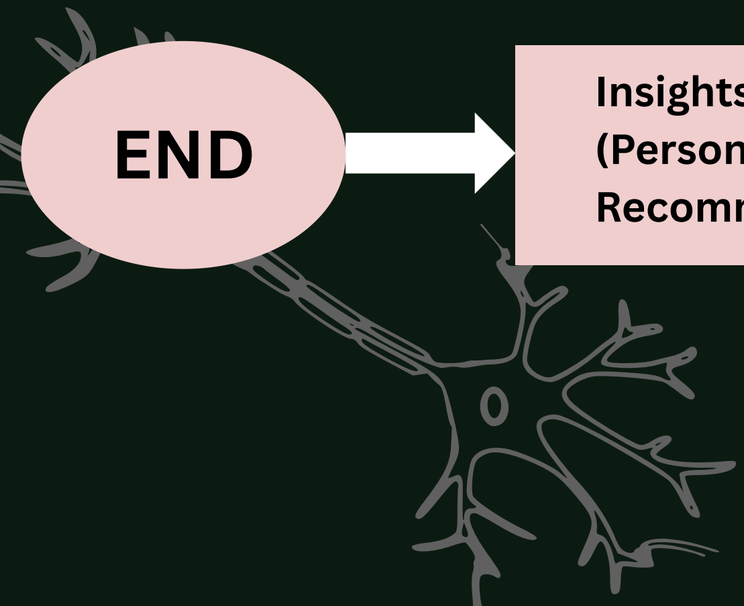
Feature Extraction (Behavioral Scores)

AI Risk Prediction (Binary Classification)

Risk Assessment (Low / High)

Insights (Personalized Recommendations)

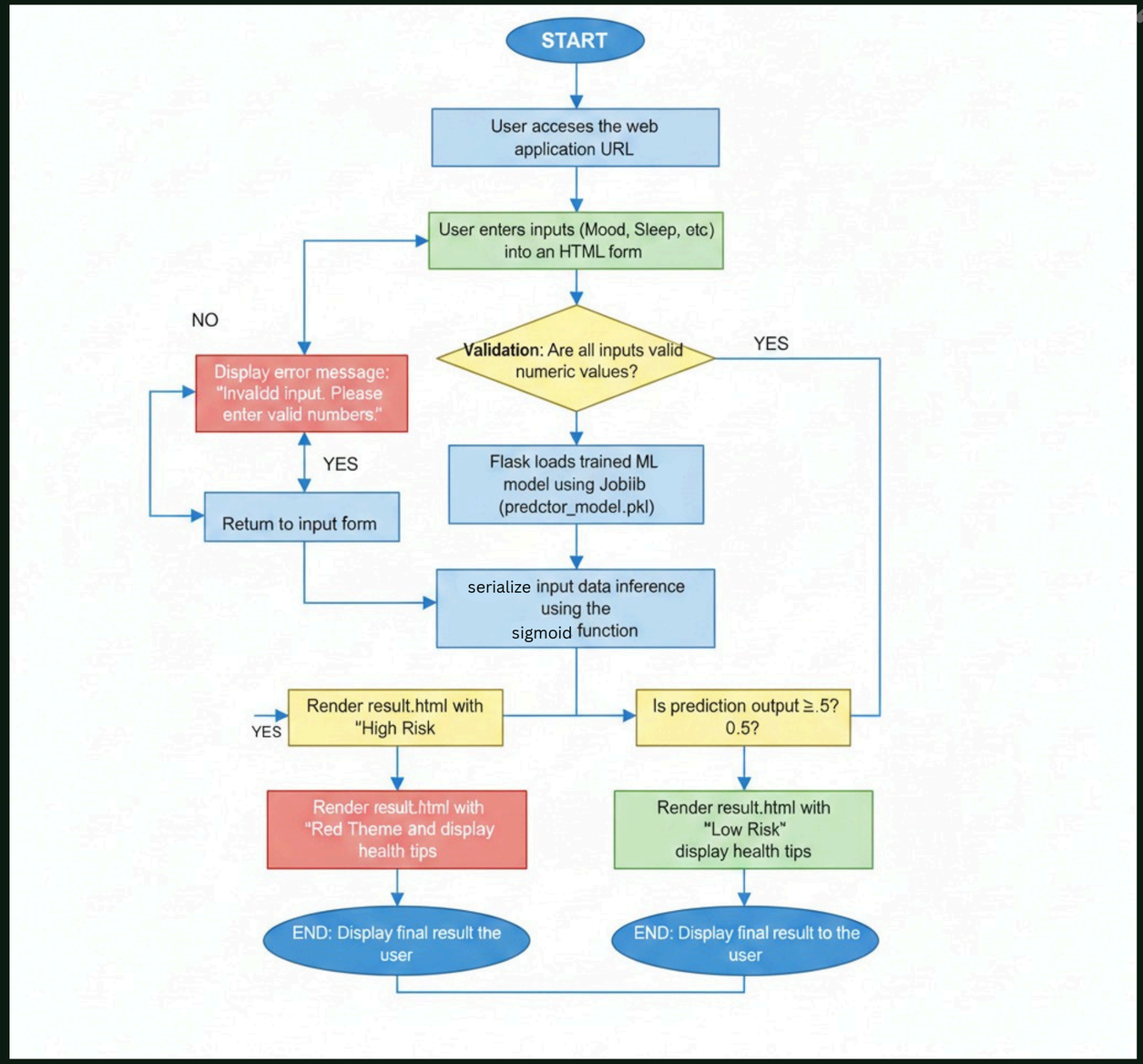
END



System Design

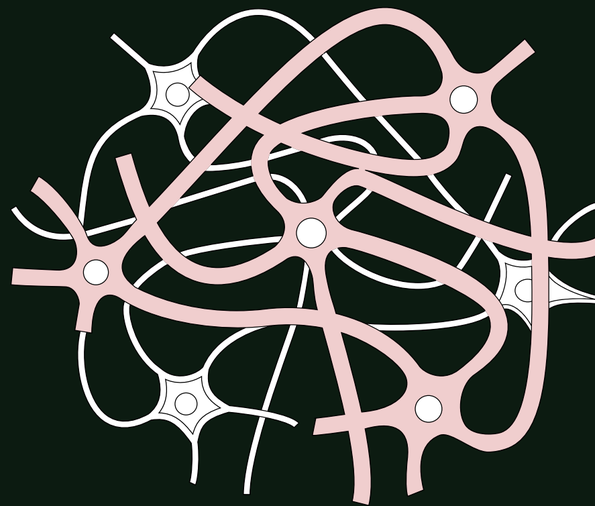
- *High-Level Architecture: Client-Server Model.*
- *Frontend: HTML5, CSS3, and Jinja2 templates for a responsive user dashboard.*
- *Backend: Flask (Python) handling the request-response cycle and model inference.*
- *Design Diagrams:*
- *ER Diagram: Models the logical entities: User, Input Metrics, and Prediction results.*
- *Data Flow Diagram (Level 1): Illustrates the movement from raw user input to the processed AI prediction.*
- *Input Requirements: Validates four key parameters: Mood Score (1-10), Sleep Hours (0-15), Activity Rating (1-10), and Diet Quality.*
-

Implementation



Result & Analysis

- System Reliability: The model correctly identifies standard risk profiles based on established lifestyle markers.
- Functional Verification:
- Test Case 1 (High Risk): Input of low sleep (<4 hrs) and low mood (<3) successfully triggers the "High Risk" alert.
- Test Case 2 (Low Risk): Input of optimal sleep (>7 hrs) and high activity triggers the "Neurological Wellness" confirmation.
- Response Latency: System completes the logic execution in under 0.5 seconds locally.
-



Conclusion & Future Scope

Conclusion:

- Successfully integrated a machine learning model into a user-facing web dashboard.
- Created a working prototype for non-clinical neurological risk screening.
- Maintained a lightweight and high-performance local execution environment.

Future Scope (Roadmap):

Advanced AI: Integration of Recurrent Neural Networks (RNNs) to analyze temporal patterns (trends over weeks).

- Interoperability: Implementation of FHIR/HL7 standards to allow data sharing with hospital management systems.
- IoT Integration: Real-time data sync with smartwatches for automatic sleep and activity logging.