IEEE SRS FORMAT

Mental health and well-being surveillance, assessment and tracking solution among children.

1. Introduction

1.1 Purpose

This project aims to create a comprehensive system for monitoring children's mental health and well-being, enabling early detection of issues, timely interventions, and support for positive emotional and psychological development.

1.2 Scope

The scope of this project includes developing tools to assess and track children's mental health and well-being. It will involve creating user-friendly surveys, providing resources for parents and teachers, and offering training for professionals. The goal is to promote early detection, support interventions, and improve overall mental health in children.

Definitions, Acronyms, and Abbreviations

- **NLP**: Natural Language Processing
- **RNL**: Recurrent Neural Network
- **LSTM**: Long Short Term Memory
- **ML**: Machine Learning
- **HTML**: Hypertext Markup Language

1.3 References

- IEEE SRS Guidelines
- Research papers on federated learning and mental health diagnosis

2. Overall Description

2.1 Product Perspective

The mental health project aims to develop an innovative digital platform that provides personalized support, real-time symptom tracking, and access to resources, enhancing overall well-being and promoting mental health awareness.

2.2 Product Features

1. **Privacy Preservation**: Ensures no personal data leaves the user's device.
2. **Real-Time Diagnosis**: Provides immediate mental health assessments.
3. **Personalization**: Tailors responses based on user engagement history.
4. **Continuous Improvement**: Enhances diagnostic accuracy using federated learning.

2.3 User Classes and Characteristics

- **Individuals**: Users seeking private mental health insights.
- **Organizations**: Institutions using the tool for early detection.
- **Mental Health Professionals**: Psychologists seeking initial diagnostics.

2.4 Constraints

- Data privacy regulations such as GDPR must be followed.
- The chatbot must operate efficiently on resource-constrained devices.

3. Specific Requirements

3.1 Functional Requirements

1. **Diagnosis Generation**:
    - Detect conditions such as anxiety and depression based on user input.
    - Provide real-time feedback.
2. **Privacy Assurance**:
    - Use federated learning frameworks (TensorFlow Federated/PySyft) to ensure no central data storage.
3. **Model Updates**:
    - Aggregate insights across devices without data centralization.

3.2 Non-Functional Requirements

1. **Performance**:
    - Latency: Less than 2 seconds for response generation.
    - Scalability: Support for up to 10,000 concurrent users.
2. **Security**:
    - End-to-end encryption for communication.
    - Strict access control to prevent unauthorized usage.
3. **Usability**:
    - Interface should be user-friendly with minimal learning curve.
    - Support for multiple languages.
4. **Compatibility**:
    - Cross-platform compatibility (Web, Android, iOS).

4. System Models

4.1 Flowchart

A high-level flowchart depicting:

1. User Data Input.
2. Data Processing and Storage.
3. Real-Time Insights and Alerts
4. Data Analysis
5. Personalize Interventions

4.2 System Architecture

- **Frontend**:
  - Developed using HTML, CSS, and JavaScript for a responsive interface.
- **Backend**:
  - Python-based, leveraging Flask/Django for handling APIs.
- **Federated Learning Framework**:
  - TensorFlow Federated for decentralized model training.

5. Other Requirements

5.1 Legal and Ethical Concerns

- Compliance with GDPR and HIPAA for data privacy.
- Ethical AI practices ensuring unbiased and fair diagnostics.

5.2 Assumptions and Dependencies

- Users have devices with basic computational capabilities.
- Stable internet connection for federated learning synchronization.