Sleep Master

Overview

The project involves developing a comprehensive “sleep tracking app” for Android devices, tablets, and TVs. It aims to help individuals experiencing sleep issues, such as difficulty falling asleep, waking up too early, or trouble resuming sleep after waking.

Problem Statement

- Sleep-related issues, such as insomnia, sleep apnea, and irregular sleep patterns, affect millions of people, leading to poor health outcomes, reduced productivity, and decreased quality of life.
- Current solutions often lack AI-driven, and offline-capable functionalities that can provide actionable insights into sleep behavior.

Solution

- Utilizing the device microphone to record and analyze sleep sounds.
- Advanced AI algorithms to detect and classify snoring, sleep talking, ambient noises, and REM cycles.
- Offering features like meditation audios, binaural beats, dream meaning articles and sleep stories to enhance relaxation and sleep quality.

Core Features

- **Sleep Sound Analysis:** Detect snoring, sleep talking, pet noises, and household sounds.
- **Insights:** Monitor sleep cycles and REM phases using snoring patterns and user data
- **Relaxation Tools:** Access meditation audios, sleep stories, binaural beats, and white noise.
- **Dream Analysis and Blogs:** Interpret common dream symbols and provide sleep improvement tips.

Challenges

- **Audio Analysis Precision:** Differentiating between user-generated sounds (e.g., snoring, sleep talking) and environmental noises (e.g., bell, pets).
- **REM Detection Without Wearables:** Achieving accurate REM detection without access to physiological data (like heart rate or eye movement).
- **Offline Mode Implementation:** Recording and partially analyzing data locally and syncing it with the backend when online

Solution

- We used advanced audio processing libraries like Librosa and implement AI sound classification models to train on labeled datasets for various sound categories.
- We used sound patterns, such as variations in breathing or snoring intensity, combined with machine learning models trained on audio data correlated with REM phases.
- Develop lightweight, on-device AI models optimized for local processing to ensure critical features (e.g., sound classification and sleep cycle tracking) work offline.

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Screenshots