Sleep Monitor

a sleep detection application

Introduction

This application is designed to monitor a user's sleep and wake status by collecting data from smartphone sensors. It collects data continuously for 24 hours and generates a CSV file with the recorded information. The collected data can be utilized in various ways, including generating decision tree algorithms to predict whether the user is sleeping or awake. This flexibility allows the app to support personalized insights and a range of research applications focused on sleep behavior and sensor-based analysis.

Permissions Required

When the application is launched for the first time, it requests the following permission:

- Modify System Settings: This permission is required to adjust the device's brightness level.

Granting this permission is essential for the app's functionality.

Main Interface

Initial Screen The main screen displays the current monitoring status	• **“You are awake. Monitoring...”**: Indicates the app is monitoring while the user is awake. • "**You are sleeping. Monitoring...":** Indicates the app is monitoring while the user is asleep.
Control Buttons Two buttons allow the user to update their current status	• **"Going to Sleep":** Sets the status to "sleeping" and updates the main text to "You are sleeping. Monitoring...". • **"I Woke Up"**: Sets the status to "awake" and updates the main text to "You are awake. Monitoring...". • By default, the app starts with the status set to "awake".

Sensor Data Collection

The application collects the following sensor data every minute:

- **Accelerometer**: X, Y, and Z-axis readings.
- **Brightness**: Current screen brightness level.
- **Proximity**: Proximity sensor readings.
- **Gyroscope**: Angular velocity data.
- **Status**: Tracks whether the user is "awake" or "sleeping", based on button inputs.

Data Logging

Collection Frequency	• Sensor data is collected every 1 minute for 24 hours. • A total of 1,440 records are logged within the 24-hour period.
CSV File Generation	• Once 1,440 data entries are collected, the app generates a CSV file. • The CSV file contains all the sensor readings and the user's status for each minute.
Data Fields in CSV File	• **Time**: Timestamp of the data collection. • **Accelerometer X, Y, Z**: Readings from the accelerometer sensor. • **Brightness**: Device brightness level. • **Proximity**: Proximity sensor value. • **Gyroscope**: Gyroscope sensor readings. • **Status**: "awake" or "sleeping" based on user input.