SE101 Lab Project - Proposal

Sleep Analysis System

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Project Description

We will create a sleep analysis system that can be connected to a bed.
The system will collect data through various sensors, and analyze that data based on sleeping patterns to optimize your sleeping environment and wake you up at an opportune time.

Software Components

- Collecting real-time data
- Sending data from an Arduino to a Rasberry Pi
- Running a web server displaying the analytics on the Rasberry Pi

Prototype Plan

The method of our prototyping will be evolutionary.
We will start with hardware/sensor integration, then add the communication between devices (Arduino and Rasberry Pi), then display the data through a local web server.

Required Hardware

- Arduino board
- Raspberry Pi/Ethernet Shield
- Half-size breadboard
- Stacking headers for feather
- Microphone
- Motion sensor
- Brightness level (lux) sensor
- Temperature/Humidity sensor
- Speaker

Anticipated Challenges

- Integrating all the sensors and collecting useful data for analysis
- Transferring information to the mobile app
- Calibrating sensors for small changes to the sleeping environment