

Smart Medication Dispenser

Project Overview

Project Statement

Managing medications can be tricky, especially when one is prescribed multiple medications with different schedules and amounts. People will often miss a dose of medication, so they will use a weekly pill organizer that they have to refill by hand to remind themselves in the morning or afternoon. This solution doesn't allow flexible medication schedules that require doses exceeding two or three times a day. Additionally, people can forget to refill medications when it is low which leads to hours to days of missed medication, leading to an increased risk of health consequences.

Objective

The goal is to create a "smart" medication dispenser - paired with a phone app - where the user can input the medication information into the app, attach their pill bottle to the dispenser, and let the app notify the user when it is time for each medication. When the user is then in front of the dispenser, they will notify either the dispenser or the app that they are ready for their medication. The dispenser will then use multiple motors to dispense individual pills from their corresponding upside-down pill bottles. Lumping groups of similarly scheduled medication together is ideal to avoid multiple unnecessary disbursements. In addition to dispensing, the combined system will log the quantity of each medication which can be used to alert the user when the quantity is low. Creating an enclosed case with a possible lock may be beneficial to keep out-of-reach from children.

Project Tasks

System Design

- Determine system requirements for the architecture including high level design and schematic
- Identify the hardware components needed to fulfill the goal

Hardware Design

- Prototype using development boards
- Create a way to disperse individual pills from an upside-down medication bottle
- Develop a PCB
- Design and print 3D parts as needed

Software Design:

- Interface with sensors using I2C, SPI, Bluetooth
- Android/iOS app development for creating the scheduler and medication input field