iPill: An Automated Pill Dispensing System

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Introduction

According to the Drug Abuse Warning Network, more than 50% of emergency departments visits in 2011 could be attributed to nonmedical use of prescription drugs, which are mostly in the form of pills. The abuse of prescribed drugs costs the United States over $600 billion annually to deal with substance abuse. These numbers call for a smart and efficient solution to reverse the trend. At its core, iPill is a project with public health, safety, and welfare as its foremost concerns.

Objective

Design and fabricate a smart pill dispenser that assists patients and help minimize prescription drugs abuse.
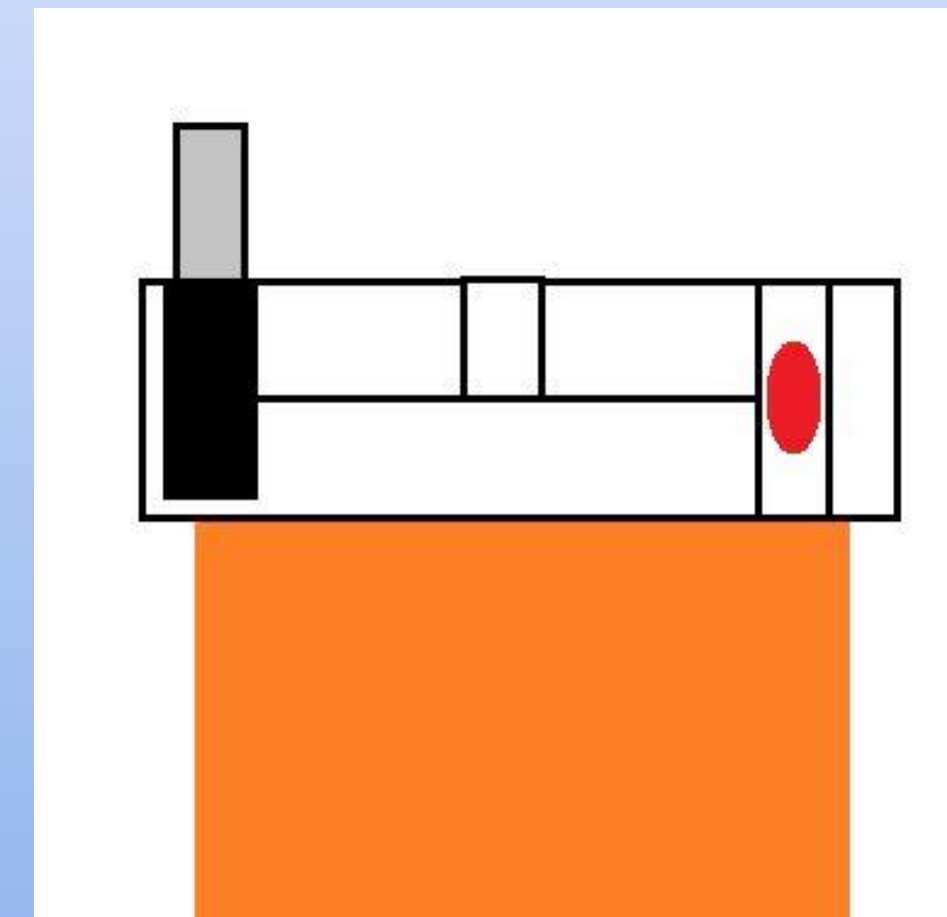
System Components

Base Module
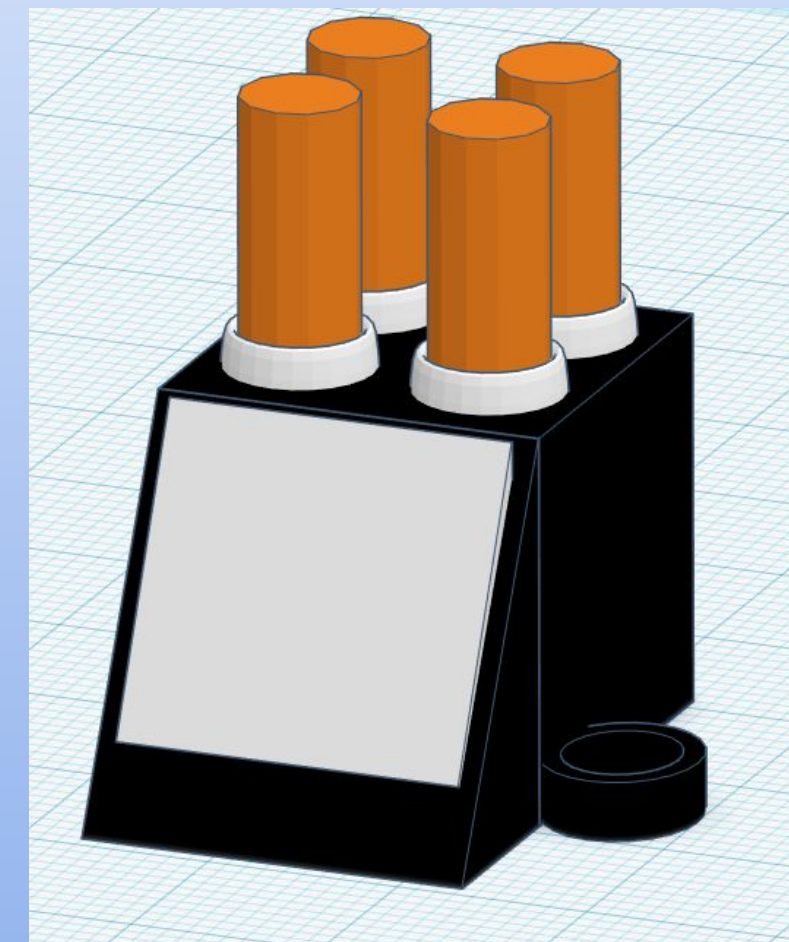
- Controlled by Raspberry Pi 3
- Touch screen acts as UI
- Servo motors to operate smart lid mechanism
- Dispenses pills into dish on the side of the module

Smart Lid

- Has a USB flash drive to store prescription information
- Lid mechanism rotates when slotted into base and motor turns on

iPill System Functionality

Pharmacist fills bottle and tops it with a smart lid which contains data on how often the drug should be taken. Patient then inserts bottle into the base module, which will read data from lid and dispense pills accordingly.
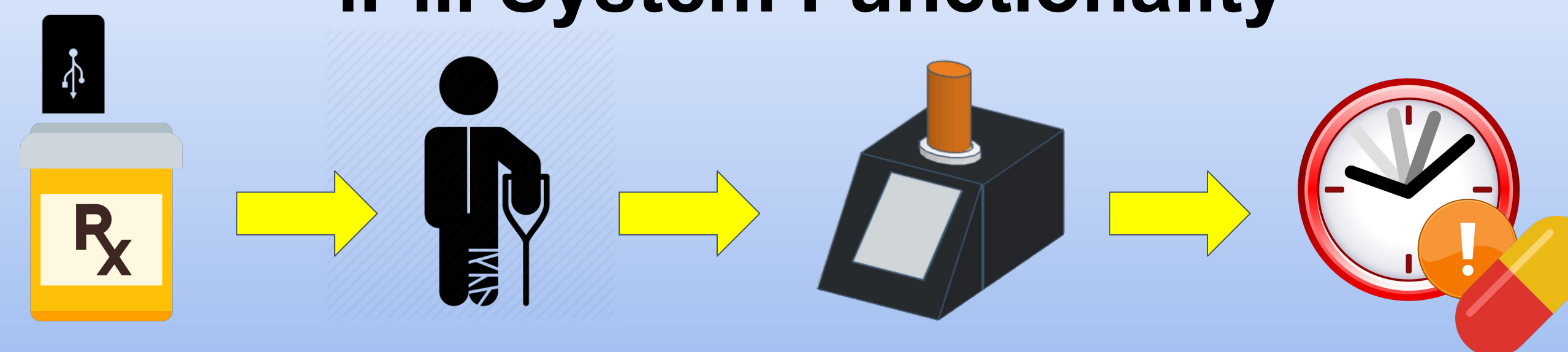
Upcoming Features

- Missed dosage notifications for user, caretaker, and/or primary physician.

- User permissions to modify dispensing time.

- Early dispensing system to accommodate traveling and/or limited access to iPill.

- Smart lid upgrade to be compatible with different pill sizes.

- Camera or IR sensor to ensure pill has been dispensed correctly and collected.

Current Progress

- Finalized design of components to be 3D printed.

- Obtained required hardware(Raspberry Pi 3, USB flash storage, standard sized pill containers).

- Determined the most compatible pill dispensing technique.