PILL MANAGEMENT SYSTEM

MAIS Team

THE PROBLEM

Theme: Healthcare

Medical Non-adherence: Patient deviates from prescribed treatment regimen due to incapability

Consequences: Recurrence of illnesses, Antibiotic resistance, Ineffectiveness of drugs

40% of medications are not taken as prescribed and this non-adherence costs $100B per year (New York Times, 2018)

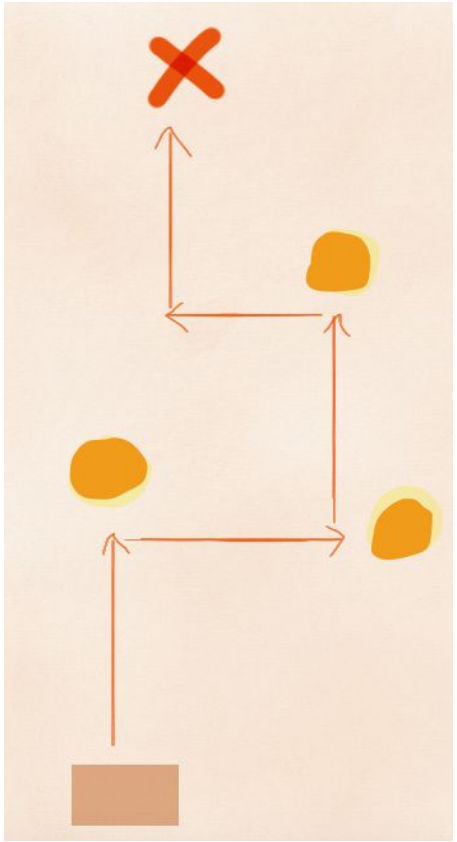
OUR SOLUTION

- Use automation instead of depending on human memory
- An App is used to monitor time and type of medicine desired
- A Robot containing medicine arrives at current location of patient and dispenses required medicine at allotted time

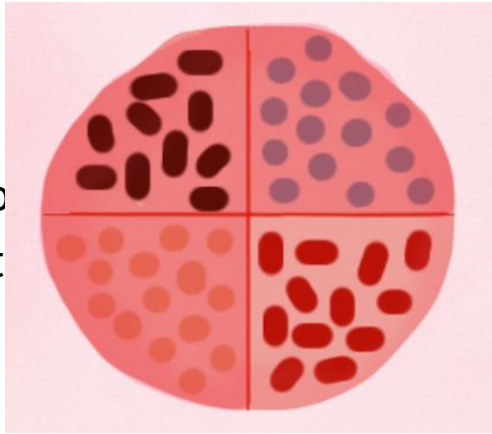
HOW IT WORKS

The patient chooses a time and type of medicine to take through the Pill Management App.

At that allotted time, the robot sends a signal to the patient's mobile phone (via a bluetooth module) and begins travelling towards the patient (using DC Motors). The robot is able to avoid obstacles (using infrared sensors).

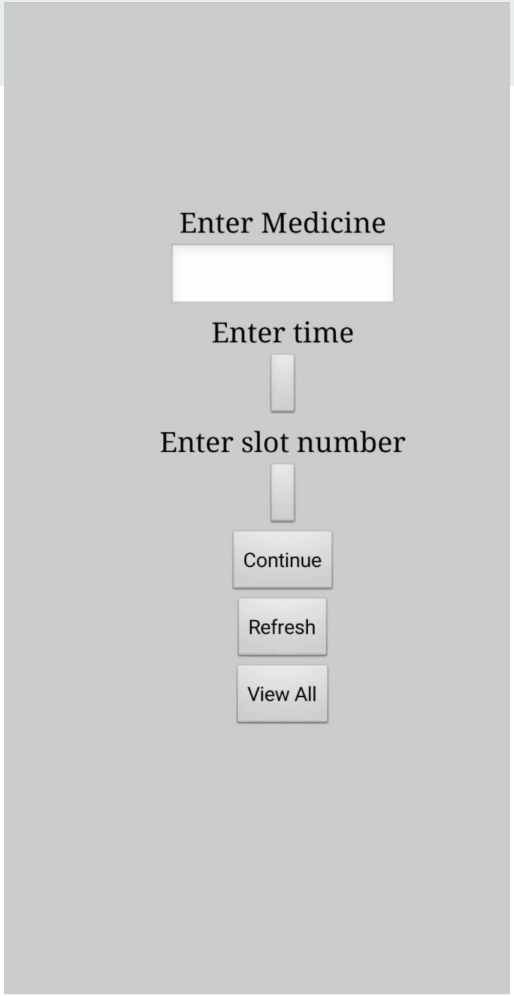


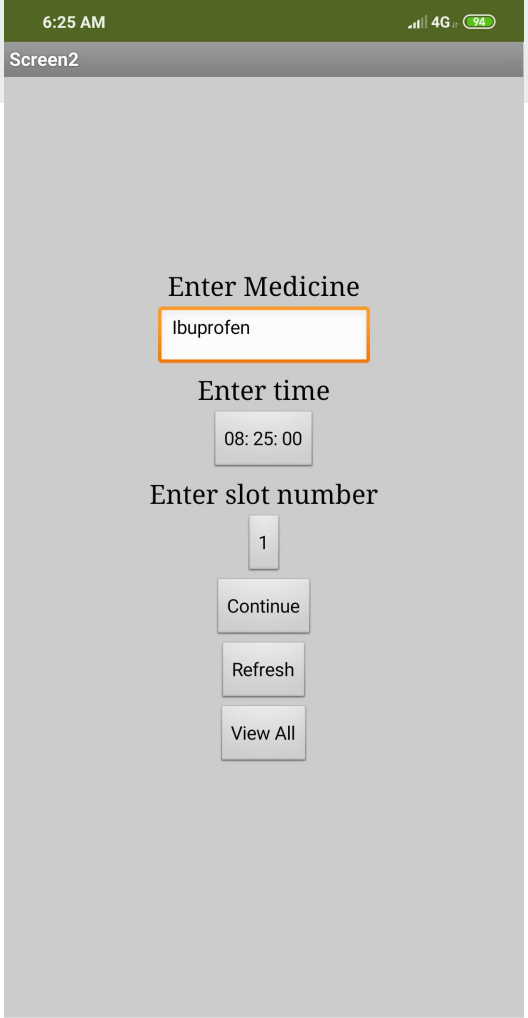
The Robot contains four slots holding different types of medication, and turns to the desired slot (using a Servo Moto upon arrival. The type of medicine and the time is displayed t the patient (via an Arduino LCD Display).

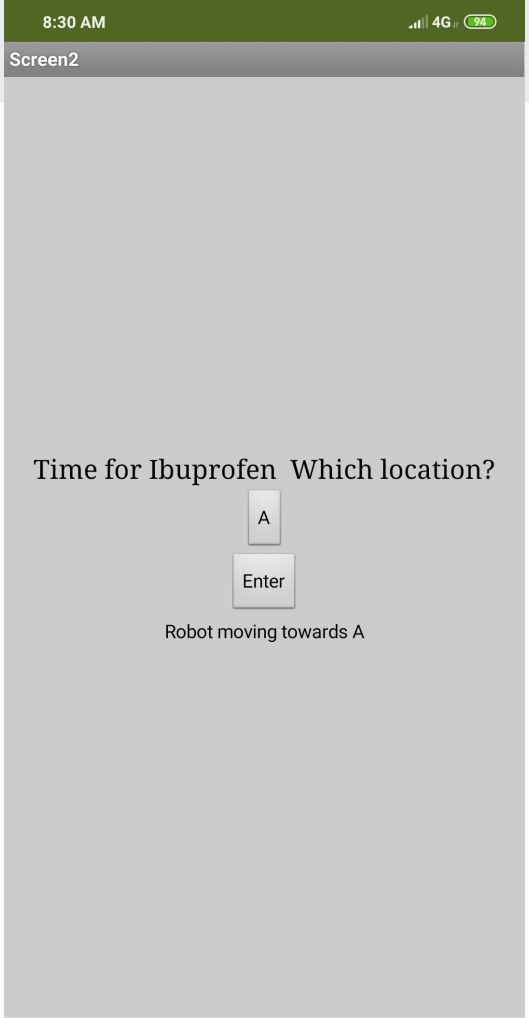


Hardware used: Raspberry Pi 3B, DC Motors, Servo Motors, Infrared Sensors, L293D Motor Driver, Arduino & LCD Display

Software used: MIT App Inventor, Raspbian Jessie


Enter Medicine
Enter time
Enter slot number
Continue
Refresh
View All


6:25 AM
4G
94
Screen2
Enter Medicine
Ibuprofen
Enter time
08: 25: 00
Enter slot number
1
Continue
Refresh
View All


8:30 AM
4G
94
Screen2
Time for Ibuprofen Which location?
A
Enter
Robot moving towards A

FEASIBILITY

- User is only required to input medication schedule once and refill pills
- This robot would be particularly beneficial to Alzheimer’s and Dementia patients, and also to immobile patients
- This robot can be deployed in healthcare centers

FURTHER DEVELOPMENTS

- Dispensing specific dosages
- Indoor house-mapping using SONAR-based platforms to enhance accuracy and efficiency
- Tracking non-adherence and subsequently alerting emergency contacts