CSULB – College of Engineering
Computer Engineering
Senior Design Project
CECS-490A

Dr. Pill

Team:
- Jonathan Cerniaz
- Jehmel Espiritu
- Jeremy Espiritu
- Joseph Guzman
- Afzal Hakim
- Lee Roger Ordinario

Prof - Dan Cregg

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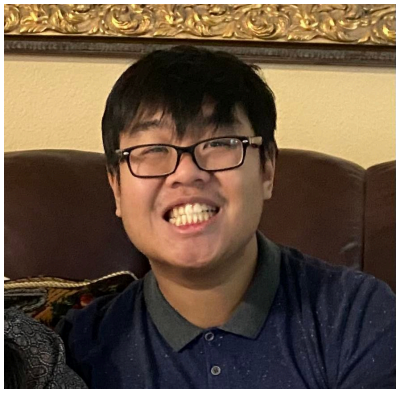
Executive Summary

Dr. Pill will be our interpretation of an Automatic Pill Dispenser to address the common issue of medication management, especially for the elderly and those who lack the time or simply do not want to interact with the physician. Our product aims to simplify the process, reduce human error, and enhance medication adherence through innovative features. This idea was sparked by our excitement to work in the health field, especially with many options to work on tech-driven healthcare solutions, and we are excited to work on a hands-on project that can simplify and speed up the prescription process.

Team Members

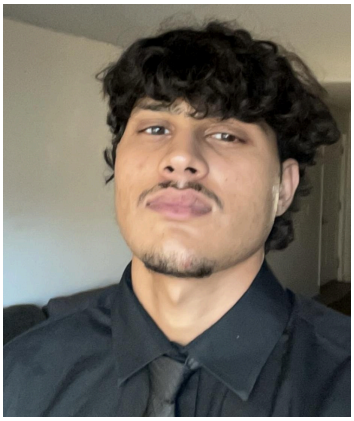
Jonathan Cerniaz, a fourth-year student interested in the intricacies of technology. He thrives on hands-on projects and practical problem-solving when not immersed in tech.



Jehmel Espiritu, a fourth-year student interested in the inner workings of the computer. His goal is to further their knowledge and use it in their respective field.

Jeremy Espiritu, a fourth-year student interested in computer hardware and the development of said hardware. He plans on using their knowledge to further himself in any career/project he is involved in.

Joseph Guzman, a fifth-year who prefers the electrical and hardware side of the field. His goals are to discover new advancements and improve on existing ones.



Afzal Hakim, a fourth-year student with a passion for learning new technology. He enjoys tackling hands-on challenges to repair and improve systems.

Lee Roger Ordinario is a fifth-year student whose goal is to learn from existing technology and designs. He plans to incorporate what he has learned into other fields that could benefit from it.

Team Roles and Responsibility

We plan to split into three groups of two, with each team assigned to a different aspect of the project based on our location, interests, and preferred roles.

Team 1: Jonathan Cerniaz & Joseph Guzman [Interest in Hardware]
- Building the enclosure and framework
- Circuitry
- User interface program

Team 2: Jehmel Espiritu & Jeremy Espiritu [Experience in Medical Field]
- Pill tracking and dispensing
- Screen display
- Dispense history

Team 3: Afzal Hakim & Lee Roger Ordinario [Interest in Cyber Security]
- Security (facial recognition, number pad, fingerprint scanner)
- Mobile App (optional)

Project Details

This project solves several problems related to how error-prone humans are, especially when they need to take certain medications. This project is aimed to limit the amount of errors through automated solutions. We will be implementing a system that prevents the user from taking more pills than they need in a certain timeframe, while also warning patients that they have not taken the medication that they need. This will be automatic for patients or nurses,

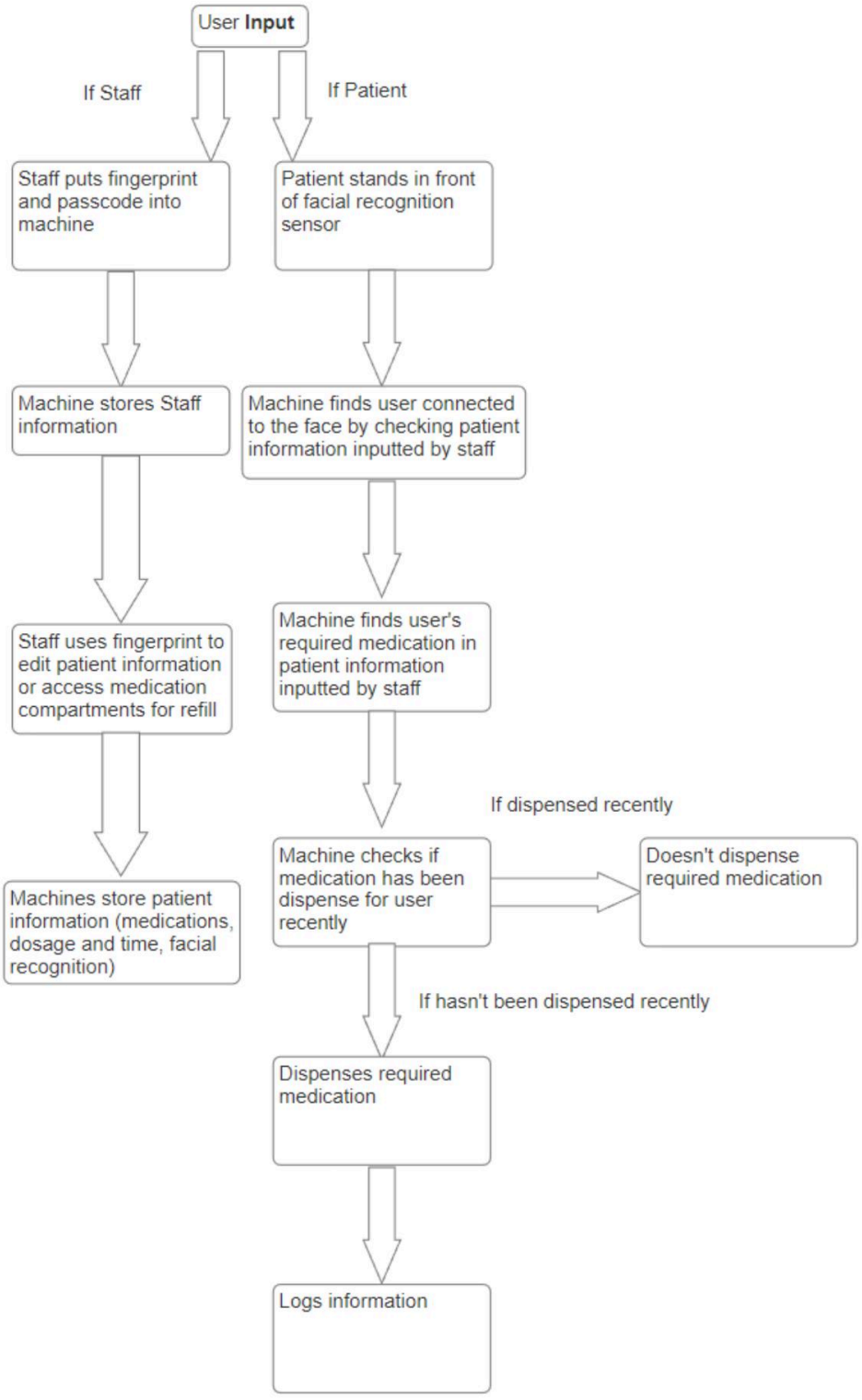
depending on who will have access to our product. In order to do this, we will have a timer for each patient and will allow the machine to withhold medication if it has been dispensed too recently for the user detected. Our project will automatically dispense pills depending on the user through the use of facial recognition. For now, we're thinking of having scales in each pill compartment to measure the weight of the pills to verify the number of pills in the storage unit. If a user requests one pill, you can confirm with the weight that the device has dispensed only one pill. Due to the nature of the pill dispenser, the different pills that have been dispensed will be detected and logged to ensure the organization in charge can keep track of inventory and where things have gone. This information will only be accessible by the owner of the project, who will verify it through a number pad and/or fingerprint.

We believe this project can be completed within two semesters due to our well-organized approach and division of tasks. By breaking the project into manageable tasks and leveraging each member's strengths, we plan for steady progress throughout both semesters. In addition, each group has access to resources that help with what part of the project they are involved with. For hardware, it's important for both team members to be nearby with a place nearby to buy the necessary materials. The team in charge of screen display is in charge of user interface, meaning that they must be familiar with the needs of the users, whether it's a patient or nurse. For the team in charge of security, they must have some history or supplies regarding the means of verifying the user.

Features:

- Auto Dispense
- Auto Track Pills
- Dispense History
- Facial Recognition
- Fingerprint Scanner
- Mobile App (optional)
- Number Pad
- Power Supply
- Raspberry Pi
- Screen Display

Block Diagram:



Inspiration:

Appendix

References

"Pill Counting Scales." *DSCBalances*, www.dscbalances.com/collections/pill-counting-scales.

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