Self Administering Insulin Devices

Proposal Design

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The main goal of our project is to improve the treatment method of individuals who are diagnosed with Diabetes. In the United States, there are about 23.7 million adult Americans that have diabetes, while worldwide, 346 million adults are affected (Scully, 2012). We are trying to give people, who have this disease, a simple, easy to use and cost effective device.
Approach

M/NIR Sensor

- Noninvasive method of BGL monitoring
- NIR: 700–2500 nm (near)
- MIR: 2500–25 µm of electromagnetic waves (mid)
- This specific method does not have a current working device that has high accuracy (a main reason that peaked our interest).
Design

Infrared Obstacle Avoidance Sensor Module for Arduino Smart Car Robot
Why We Need a CSE

- **Algorithm Development:** Design an algorithm to accurately calculate insulin dosages based on the measured glucose levels and store that data.
- **Circuitry Integration:** We want to integrate LEDs and photodiodes to ensure seamless communication between hardware components and the software controlling them. Therefore, the student should have some basic knowledge of feedback loops.

Having a CSE student on our team would aid us in creating a functional automated insulin administering device with high accuracy. Although some members of our team have knowledge of coding, it is limited and mainly focuses on data processing. We need someone who understands electrical components as well as coding and understands the integration of the two.
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| **PHASE 1:** (Summer and first half of Fall 2023 semester): | - Continued research on the design of the device and finalizations on its outcomes and specifics.  
- Software engineer joins our team with experience in app design and creation. App discussions begin with its logistics and design. |
| **PHASE 2:** (Second half of Fall 2023 semester and Winter Break): | - Research on mechanics of the device.  
- Finalizations made on the circuit system used in the device, the electronics and software components as well as the sensors as the biomarkers.  
- Research on the most applicable and beneficial biomaterials suited for the device function.  
- App building and designing.  
- The 3D printing outline of the device should begin. |
| **PHASE 3:** (Spring 2024 semester): | - All materials for the design should be finalized and ordered.  
- The 3D printing outline of the device is finalized and printing begins (CAMID).  
- All circuits are built and well functioning.  
- Software, electronic components, programming and biomarker sensors finalized.  
- The device should be built and put together and tested along with the app to determine improvements that should be made for the device to be ready for showcase. |
Work Cited


