

“The Walking, Car”

Project Proposal

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Problem Statement

Our project is an innovative way to promote and encourage kids of all ages to be physically active.

Background Description of Problem

This Project will bring a new and more fun type of toy to share with any friends. This product is designed for a single person. There will be force sensing gloves to wear, which depending on the hand that you squeezed, will control the direction of the crimsonbot, either turning left or right. There will also be accelerometer sensors strapped to your ankles, which will detect changes in your legs motion, causing crimsonbot motors to turn on when you start moving and to turn off when you stop moving.

Timeline

Key:

A: Annika B: Brody C: Christian

A: Website and GitHub Repo	10/9
ABC: Project Proposal	11:59pm 10/10
C: Parts Order Wish lists	10/12
ABC: 1st Prototype	10/19
ABC: Responsible Conduct of Research for Engineers	10/19
ABC: 2nd Prototype	10/26
B: Beta Test Plan	10/31
ABC: Status Presentation	11/2
ABC: Beta Logistics	11/7
A: Poster Draft	11/9
ABC: Beta Test Demo	11/14

ABC: Beta Test Final Protocol	24 hours after Beta Test Demo
B: Symposium Registration	11/16
ABC: Practice Symposium Spiel in Class	11/27
ABC: Symposium Demo	11/30
ABC: Instructable Draft	12/4
ABC: Instructable Final	11:59pm 12/8
ABC: Peer Review	11:59pm by 12/9

Individual Milestones:

Annika: Personally, I would like to learn more about how electronics work and how to code them to do different things. I would also like to improve my programming skills, especially with python. Currently, python and electronics are not intuitive to me, but I would like them to be more intuitive by the end of the semester.

Brody: A milestone for me would learn how to become a better program and become more advanced in the technology aspect rather than the physical hands on interactions. Also taking more advantage of the labs resources.

Christian: A milestone I will need to finish is learning how the nodemcu functions and the libraries that exist for allowing it to interact with different protocols.

Team Milestones:

As a team we hope to achieve nothing less than a fully functional wireless device. We plan to meet every deadline and we will iterate on our design after each prototype

Management Plan

Brody is the elected team leader. We communicate through a group text and use google drive to collaboratively work on assignments. We are planning to have a weekly meeting on Tuesdays at 10:45 for around an hour. Meetings will be held more frequently as the project begins prototyping.

Exposures

If the wireless clips/ankle bracelet and pressure gloves don't work wirelessly, we are going to be using a wired pressure pad for the feet and wired pressure gloves. Another issue would be, cables tearing. If the esp8266 doesn't have enough current to power all the LEDs, this could be solved by removing some of the LEDs or by adding another board. We could use one board for the MCU and one board solely for the LEDs. Another exposure would be if there are

multiple inputs, then they would share polling time. When there are multiple sensors, it has to iterate across one, then grabbing each one before starting the cycle over again. With the black tape sensors, the sensors were very slow at grabbing the information about the line and would sometimes miss the line if it came too fast. This could be solved by simplifying the amount of sensors to be read.

Implementation environment and rationale

We are going to be using Python and the node MCU. We are using these because of our familiarity of python and the availability of node MCU.

Budget Estimate

We have a fixed budget totaling sixty dollars. We intend to use two flexible resistor pressure sensors, one for each hand which cost eight dollars each, and an accelerometer for the ankle which costs less than two dollars. The other materials we will be using such as cables to connect the project together should only be a few dollars. We plan on building an enclosure for our project but cannot estimate the cost now because we are unaware of the cost of materials to build it. This total to be around twenty dollars of expected cost, discounting the cost of the enclosure.

Evaluation

We want the crimsonbot to move forward when the participant is picking up their feet. The more frequently they move their feet, the faster the crimsonbot will move. When the participant squeezes their hands, the crimsonbot will turn to either side. The system will be evaluated with multiple test runs and a variation of five or more participants for different time increments making sure the system runs flawlessly for the symposium. The beta test will be done in the E101 lab room. We will begin testing as soon as our project is completed. The beta test will last around 30 minutes to 1 hour, depending on how long it will take to run the crimsonbot without any bugs on each participant. As for logistics, we need to have the car, the gloves, the clips that go on the feet, and a computer, for testing. In relation to the scheduled deliverables listed above in the timeline we intend to conduct the entire beta test between November 9th and November 15th. During each test run with a single participant at a time the team will rotate between who is helping put the device on the participant, who is recording notes for flaws, and who is leading the beta trial for that given participant.