Project Deliverable G: Prototype 2

By

Karim Rizk #8572378

André-Marie Kabeya #300067899

Vanessa Zyko #300076866

Manit Ginoya #7704610

Submitted to

Professor Rubina Lakhani

For the course

INTRODUCTION TO PRODUCT DEVELOPMENT AND MANAGEMENT

FOR ENGINEERS AND COMPUTER SCIENTISTS

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1. **Summarize the client feedback that you received during your third client meeting for your first product prototype and clearly state what needs to be changed or improved in your design.**

   Based on our notes from client meeting 3:

   - Bocar needs to see that the amplifier works
   - Bocar was afraid that we will not finish our project in time
   - Bocar needs us to start building our device as soon as possible and start on troubleshooting

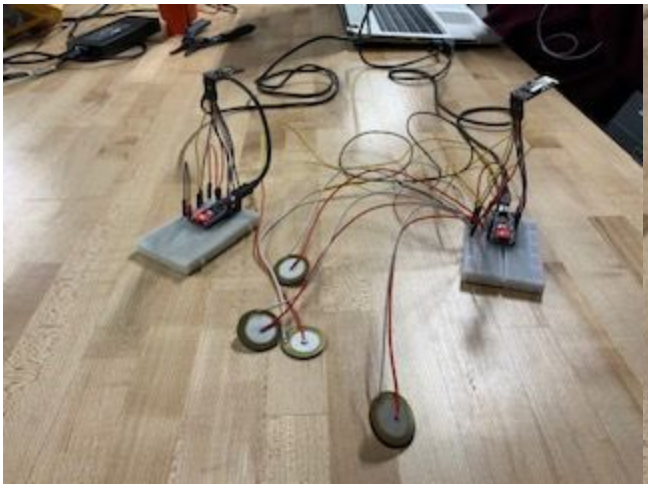
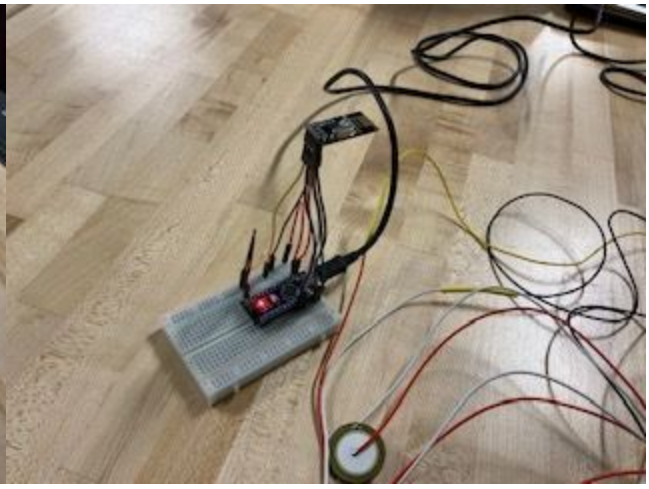
   From these main points, it is clear to see that the client is mostly afraid that the project won't get completed due to previous experience.

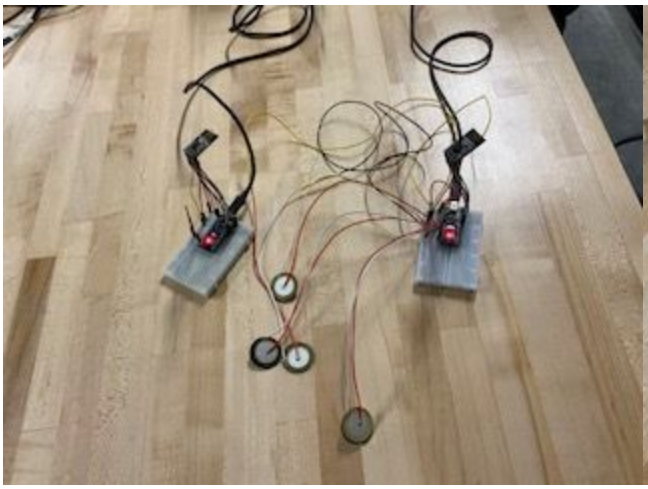
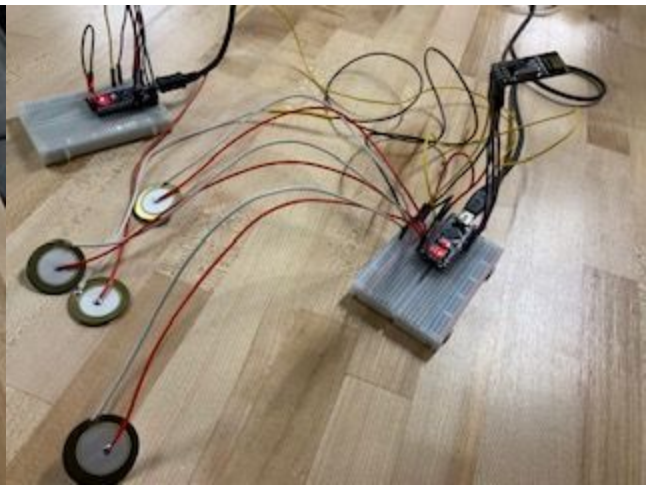
2. **Based on the feedback, develop a second prototype (or more) which will help you on your way to creating your final product.**

   Based on the feedback we received, we decided to build a second prototype that specifically focuses on writing the code that connects all four piezo sensors, attached to a breadboard and combined with both a transmitter and a receiver implementation that sends and receives information remotely.

3. **Document your latest prototype(s) using as many sketches/diagrams/pictures as required and explain the purpose and function of your prototype(s).**

   In order to present the aspect of our second prototype, here are the images/pictures showing the sensors and all the connections currently in place.

4. **Carry out prototype testing, analyze and evaluate performance compared to the target specifications developed in Project Deliverable B and document all your testing results and prototype specifications. Present your testing in an organized, tabular format that shows expected versus actual results.**

   Following the development of our second prototype, three different tests were conducted and divided into objectives, procedures, expected results and actual results,everything can be seen in the table below.

Prototype testing				
Test	**Objective**	**Procedure**	**Expected Results**	**Results**
Test 1	Test the sensitivity of the piezo sensors	Connect the sensors to a multimeter and hit them to see how they react and how sensitive they are	The sensors should be able to be accurately display a certain amount of voltage depending on the force of the impact	The sensors work just as expected. With small impact, the sensors are able to measure from 1 up to 2 volts and with bigger impacts, they can read and pick up to 3 volts.

Test 2	Remote communication using radios	By sending messages(data) from the transmitter side to the receiver side and observing if the message is fully received without a delay	Both sides(transmitter and receiver) should interact with each other pretty quickly and send information without any interruption and/or delay	The remote communication is successfully established and the messages are sent continuously without any sort of delay
Test 3	Test multiple pads at the same time to see if they all work perfectly	Connect 4 sensors to the transmitter side and hit each and every single one of them or even more simultaneously	The sensors should all work at the same time and each one of them should be able to pick up its own individual set of data	Everything works as expected, the sensors can individually send information to the receiver when hit

5. **Outline what your team intends to present on Design Day and how you intend on verifying that your "Solution Works Really Well".**

   On Design Day, we intend to present a solution to one of the biggest problem faced by elderly people, either at hospital, home or any other place where they can find themselves. That problem is that they're more inclined to fall, in most cases due to a lack of balance due to their age, some may even be losing strength in their arms or feet and may need assistance performing many different tasks. However, when that assistance isn't provided when they need it, they decide to act on their own, for example to go from one place to another or just getting out of bed, an accident can quickly happen and they may find themselves lying on the ground, sometimes for more than a couple of hours. For this project, we will only focus our attention on the patients at St-Vincent Hospital. In order to solve that issue and help those in charge of helping the patients, we decided to come up with a concept simple to implement and not super expensive. We call it "Fall collection", and as the name implies, we use a piece of clothing(in our case a T-shirt) equipped with sensors at specific locations on the body where people tend to land on the most whenever they fall. In order to make sure that our solution works really well, we'll have to test it by falling(safely) multiple times and see if whenever impacts are detected following a certain pattern in place through

the network of sensors that we built, an LED is immediately turned on. If it is the case, that LED will mainly be used as our alarm system that will quickly let the healthcare givers at the hospital know that something bad happened and that a patient needs help.