

Radio Frequency Contact Tracing System (R.F.C.T.S.)

Team 9 – Fall 2020

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PROBLEM STATEMENT

To aid with contact tracing among medical staff and patients in a close proximity environment through wearable sensors and a central receiving unit that communicate through radio frequency waves (Fig 1 below).

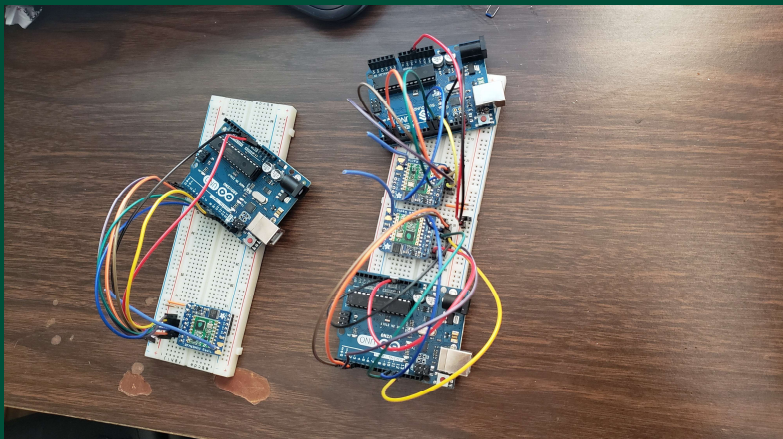


Figure 1: R.F.C.T.S. Laboratory Prototype Wearable Device and CRU

BACKGROUND

With the onset of the COVID-19 pandemic, contact tracing has become even more integral in tracing and mitigating the infection rate. Our prototype can aid in this process by maintaining a small (but scalable) radio frequency contact racing system. Drawing inspiration from the major tech companies' application in April 2020, we are aiming to implement a system of contact tracing that can be used in any environment with minimal resources, while being effective in the tracing of a deadly illness.

SUMMARY OF WORK

We created prototypes for our central receiving unit and wearable devices with Arduino development boards, a Raspberry Pi, radio transceivers, and batteries. For the software we created a simple database and SMS text messaging scripts to text individuals when they have encountered an infected individual. Next semester we will create smaller devices, improve battery performance, improve software performance, and implement encryption into our project.

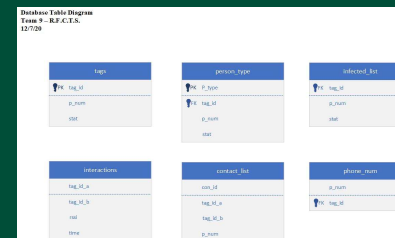


Figure 2: Database Tables
Diagram

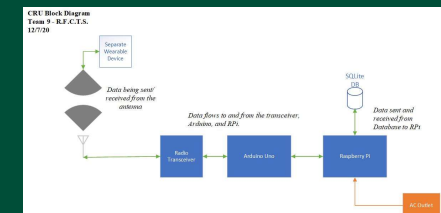


Figure 3: CRU Hardware
Diagram

IMPACT ON COMMUNITY

- This prototype could be used in different medical settings ranging from hospitals to emergency medical triages to universities due to its compact size, low cost, and scalability.
- Our prototype can help create a sense of ease and trust with the general public by being focused on privacy.
- Ideal market would include hospitals, health-based non-profits, emergency medical associations, and federal health departments (CDC).