

Problem Statement

In care homes, visually impaired people (VIPs) need assistance performing daily tasks, but caretakers may not be available to aid them all the time.

Major Requirements

Table 1

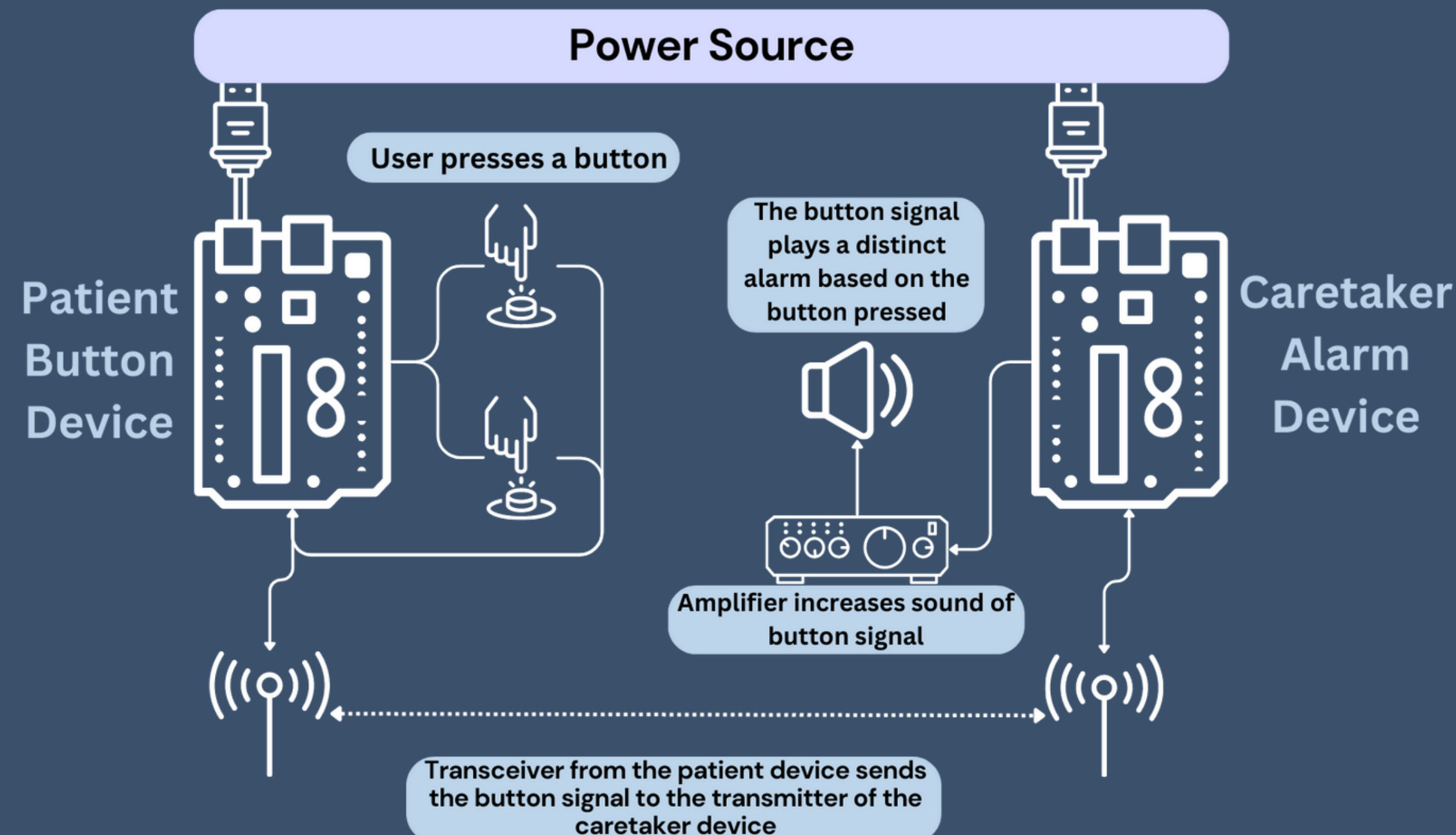
	Level	Requirement Type	Requirement Statement	Requirement Met?
Patient Button Device	1	Functional	The device shall be able to notify clients that a caretaker has been alerted	Yes
	1	Functional	The device shall be able to be used by VIPs	Yes
	2	Physical	The button shall be able to be pressed with one hand	Yes
Caretaker Alarm Device	Level	Requirement Type	Requirement Statement	Requirement Met?
	1	Functional	The device shall emit different sounds for distinct buttons	Yes
	1	Functional	The device shall transmit and receive signals greater than 40m	Yes
	1	Functional	The device shall transmit and receive signals through a wall	Yes
	2	Functional	The device shall emit sound at greater than 70db	Yes

Project Goal

Build a system that allows for communication between a VIP patient and caretaker via button and speaker devices.

Construction

Figure 1



Arduino: Arduino Uno Rev3, wires, speaker, amplifier, transceivers, button switches

Case: Wood, plexiglass, 3D printing filament

Prototypes & Design Studies

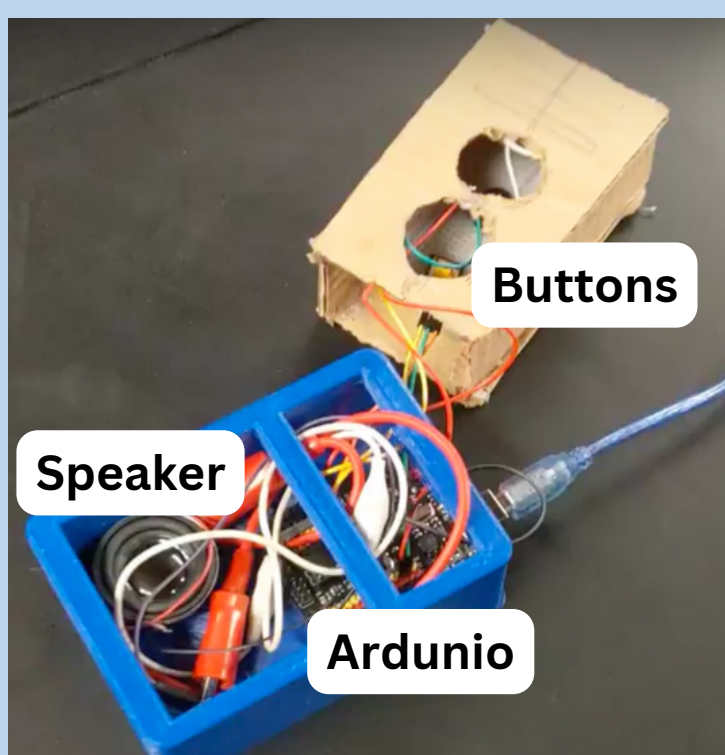


Figure 2:
Caretaker Device Prototype 1 +
Patient Device Prototype 1

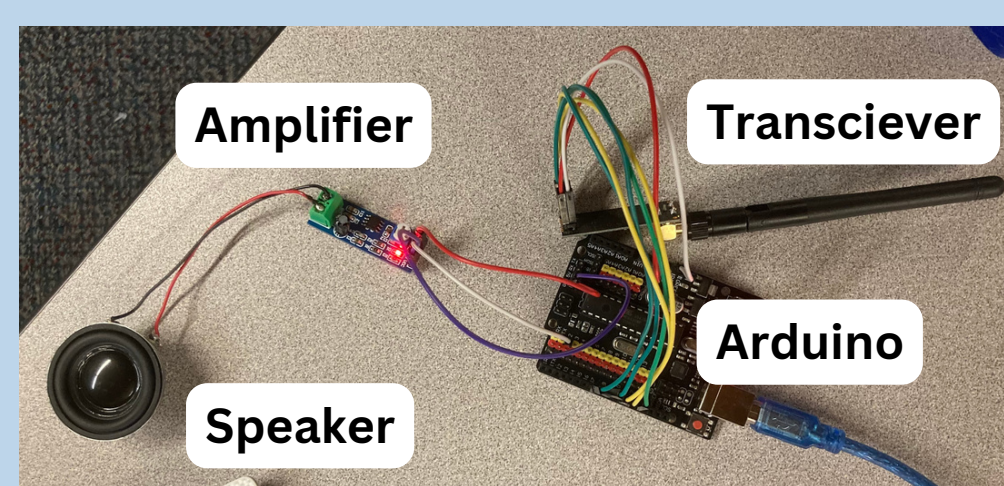


Figure 3:
Caretaker Device Prototype 2

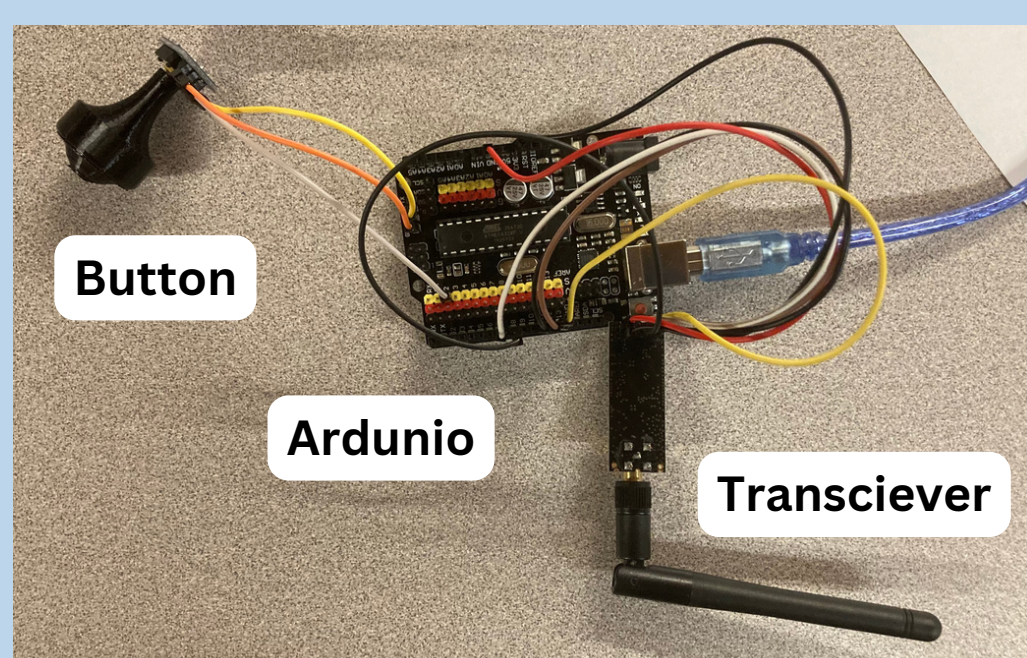


Figure 4:
Patient Device Prototype 2

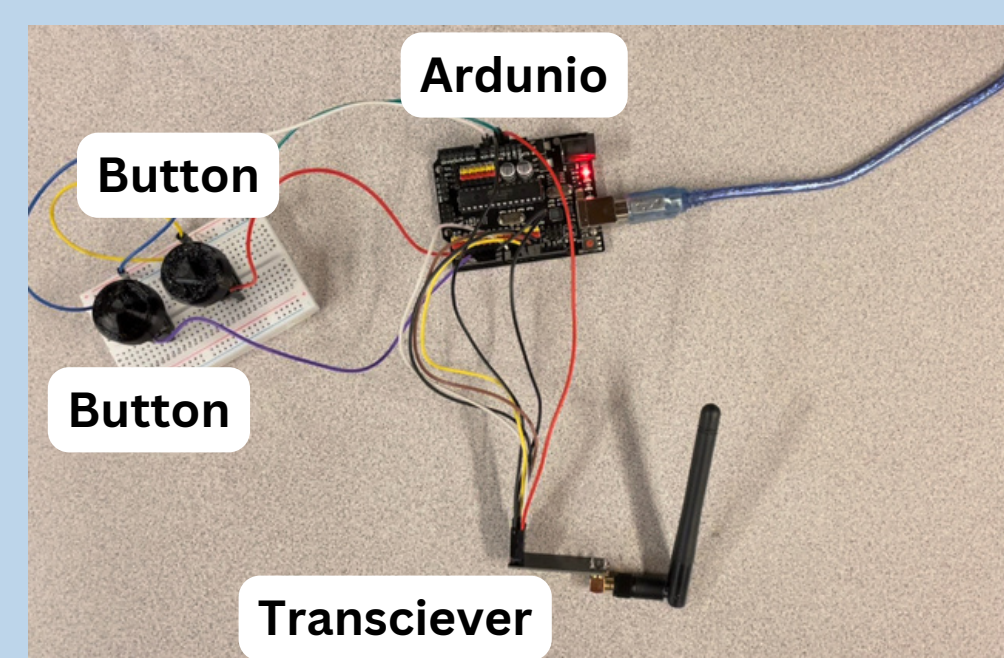


Figure 5:
Patient Device Prototype 3

Design Study 1: Distance of Signal w/o Walls

The patient and caretaker devices were separated at varying distances with no wall in-between.

48 M

Design Study 2: Distance of Signal w/ Walls

The patient and caretaker devices were separated at varying distances with walls in-between them.

**2 WALLS +
15 M**

Design Study 3: Volume of the Alarm Sound

Multiple sound tests measured the intensity of the alarm sound (in decibels).

78.4 DB

Future Works and Applications

- Add an feedback feature for the system
- Increase range of transceiver
- Add walkie talkie feature for better communication
- We can integrate our system to other places such as larger care homes, hospitals, and personal use.
- Our device will allow patients contact their caretaker for either non-emergency or emergency assistance.

Conclusions

- The device fulfills its basic functionality, but there are still improvements that could be made
- Improves on the preparedness and safety of a carehome with blind clients
- Important to make other's lives easier and feel heard and cared for