Final Project Report

Project Members:

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ECE 4564 T10

Final Project Report

Emergency Panic Button System

Concept of Operations

Our project is an emergency button system. One of the main features allows users to enter a specific person's name, age, gender, and health condition from a web UI interface. This system contains a backend system using the database to record the above information and the emergency contacts(phone, email). There are some tips retrieved from the authoritative website based on the user's health condition and displayed on the main page of our system.

A physical panic button triggers the alert and stops the signal. This system will provide multiple buttons to implement in different rooms in the house. When the user feels uncomfortable, it may affect their visual and basic body movement, so it might be hard for them to find their phone and manipulate the phone to call for help. After pressing the button, the system will send emails and SMS texts to the emergency contacts to let them know about this situation, and the system will enter the emergency mode. Suppose nobody cancels the emergency mode in 20 minutes (by pressing the button twice). In that case, it will send a text message that contains the patient information and emergency contact information, and then the location (room) in which People in emergency pressed the panic button to 911 to ask for help.

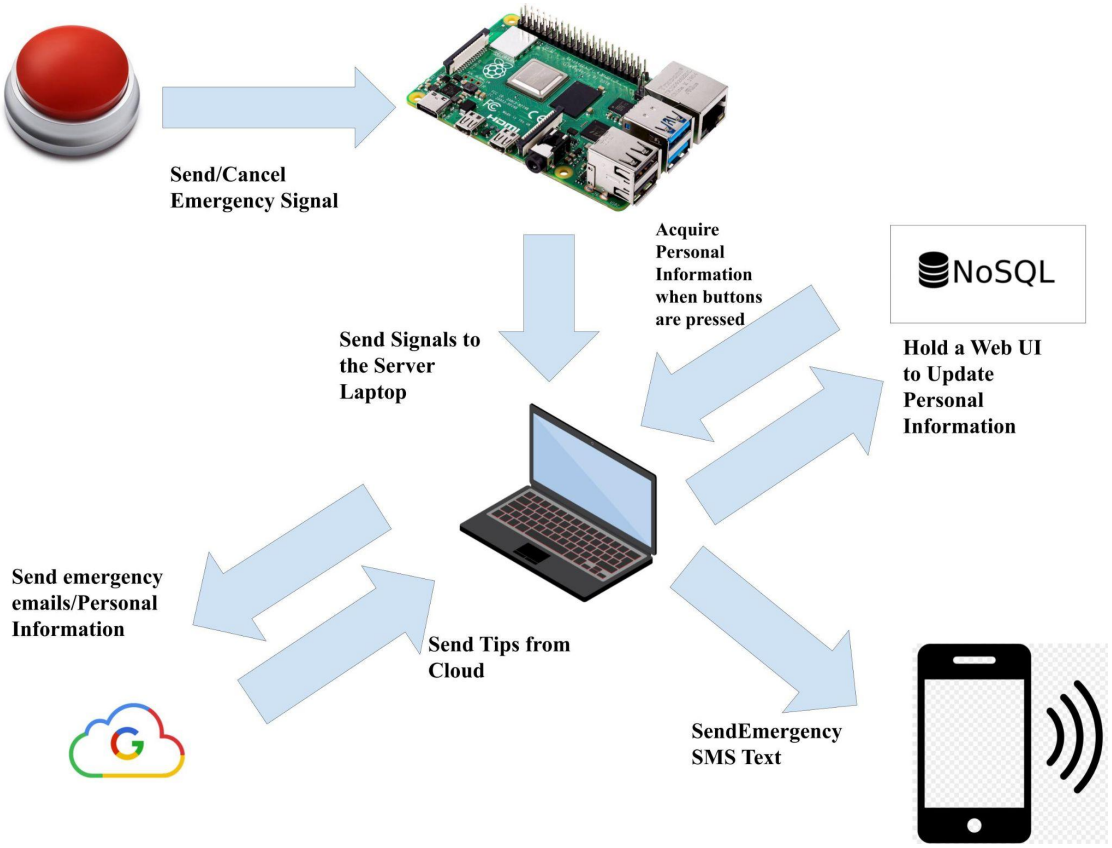
Technology can make growing old much safer than it was in the past. This system helps prevent potential danger when in bad health conditions, making it meaningful and vital.

The user will interact with this system on a laptop. All commands are requested on the computer, and our code takes care of the rest. We will create a user interface to display it readable for the user to interact with ease.

While this is just a class project, we believe it would have a tangible impact on older people struggling to age healthily.

System Overview

a) System Diagram



b) Description of system modules

Raspberry Pi: Raspberry Pi will be used to connect GPIO buttons from different rooms and send/cancel emergency signals to the server laptop.
Laptop: A laptop will hold the NoSQL stores users' names, personal information, and emergency contacts in the database. Also, build a web UI by python flask, HTML, CSS displaying details and interactable.
Web UI: A web UI will be implemented by HTML and CSS. Most information is acquired by database and RESTful.
Restful with Flask: Getting tips for the potential disease online
NoSQL: NoSQL database could store the personal information

Login System: The login system will ensure different users can update their information separately.
Buttons: Older people meeting emergencies could press the button once to send emergency signals. All the persons on emergency contacts and 911 could receive SMS messages and emails regarding persons' location, personal information, potential disease, and tips. When people feel he no longer needs help, pressing the button two more times could cancel seeking help, and all the people will get SMS messages and emails about that.

c) Three (3) testable requirements

User login system and database:

First functional part of the system: Must correctly store the user names, personal information(age, gender, potential disease, address), and emergency contact information(contact's name, email, phone number); Panel must provide the interface to update these data.

Emergency mode and Restful interactions with health tips:

The system's second functional part: The system must correctly enter the emergency mode once the panic button has been pressed. There should be a LED light that indicates the mode's status. The system must display the tips obtained from the authoritative website on the main page.

Panic button and email, SMS sending system:

The panic button must be correctly functioning, and triggering the panic button will send the email and SMS text message to the emergency contacts. Later, it must correctly send all the patient information and emergency contact information and the location (room) in which people pressed the buttons to 911 to ask for help.

Hardware List

Additional Hardware Purchase List:

Name	Product ID	Quantity	Price	Link
weideer 5pcs 16mm Momentary Push Button Switch	R13-507-5-X	1	$8.99	https://www.amazon.com/weideer-Momentary-Self-Reset-Pre-soldered-R13-507-5-X/dp/B08SQHRRDH/ref=sr_1_3?crid=3IM2GDFC6JCFC&keywords=raspberry+button+2+pin&qid=1650075287&sprefix=raspberry+button+2pin%2Caps%2C39&sr=8-3/
Total Costs:		$8.99		

Readily Available Hardware:

Name	Quantity
Raspberry pi	1

Monitor	1
Computer Mouse	1
Breadboard	1
Jump wires	20
Resistors	5

Project Schedule and Team roles

Date	Group Task	Individual Task		
		Daniel Mauro	Yuwei Wang	Shiqian Li
4/10	Socket programming and implement hardware (LED and buttons)functions	Coding for LED implementation	Coding for buttons implementation	Socket programming between Raspberry pi and the server laptop
4/17	Develop the NoSQL database and login system, and providing tips with RESTful API	Database automation	Python flask web UI development	RESTful, getting tips online by personal information

4/24	Message sending and signal processing	Handling SMS message	Handling emergency emails	Formatting messages and handling sending/canceling signals
5/1	Integration test	Hardware, socket programming integration.	Web UI, database integration	Messages integration
TBD	Final Demonstration	Be prepared for the Demonstration	Be prepared for the Demonstration	Be prepared for the Demonstration