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Remote Monitoring System

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Table of Contents

[Summary 1](#_Toc100222476)

[Introduction 2](#_Toc100222477)

[Material and Schedule 2](#_Toc100222478)

[Front end: Arduino and Sensors 3](#_Toc100222479)

[Back End: Raspberry Pi and Node-Red 3](#_Toc100222480)

[Appendix 4](#_Toc100222481)

[Preliminary Design 4](#_Toc100222482)

Table of Figure

[Figure 1: Preliminary Design 5](#_Toc100222549)

# Summary

With advanced technology, there are more and more potential risks involved in human daily life. Short circuits, leaking pipes, and other facility failures may result in serious consequences. However, in modern life, people may not wake up for 24 hours to watch every corner to ensure the facility working properly.

People need a solution for these circumstances. Our project mainly focuses on building a monitoring system to free people from those meaningless work. We use digital sensors to detect the unusual situation. If there is an error, an alarm will be triggered and inform the user that some unexpected thing is happening. There are two main sections in front end of our project, which are an error-detecting system and an alarm system. For the error-detecting system, we implement sensors with an Arduino microcontroller to convert analog signals to digital signals. For the alarm system, we use Raspberry Pi to trigger the alarm for entire system. To talk between the microcontroller and Raspberry Pie, we use Zigbee wireless module to transmit data.

For the front end to remote monitoring data, we are using Node-Red as an effectively web based human interface program. After collecting data from front end as I introduced above, Raspberry Pi will read data from the wireless module and translate them to monitor data on the web. People can easily access data from anywhere in the network.

# Introduction

# Material and Schedule

Table : Cost

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Cost per Unit | Quantity | Resource |
| Raspberry Pi 3B | $46.95 | 1 | https://www.raspberrypi.com/products/raspberry-pi-3-model-b/ |
| XBEE ZIGBEE MESH KIT | $131.60 | 1 | https://www.digikey.ca/en/products/detail/digi/XKB2-Z7T-WZM/5764681 |
| BATT HOLDER AA 4 CELL 6" LEADS | $2.61 | 1 | https://www.digikey.ca/en/products/detail/keystone-electronics/2478/303823 |
| Arduino Nano | $47.10 | 2 | https://www.robotshop.com/ca/en/arduino-nan-v-3.html |

As the Cost list above,

Table : Schedule

|  |  |
| --- | --- |
| Due Date | Description |
| Jan 28, 2022 | Get parts ready |
| Feb 4, 2022 | Install hardware |
| Feb 18, 2022 | Program software |
| Mar 13, 2022 | Program testing |
| April 6, 2022 | Oral Presentation |
|  |  |
|  |  |

# Front end: Arduino and Sensors

# Back End: Raspberry Pi and Node-Red

# Appendix

## Preliminary Design

Diagram

Description automatically generated

Figure : Preliminary Design