Faculty of Engineering and Applied Science

SOFE - 3490U Software Project Management

Winter 2023

Lab 2

Vishan Patel - 100784201
Akshat Kapoor - 100781511
Steven Mai - 100781485
Sabeh Khalid - 100754735

Tuesday, February 14th, 2023

CRN 74669, Group 2

1. The topic that we have chosen is the **camera motion sensor system**. When it comes to technology, there are many fears about one's safety and privacy. We picked this topic because we wanted to show that using that same technology, we can help protect each other. More specifically, we want to use this technology to decrease the number of robberies and home intrusions that occur in a year. A motion sensor system is a security system that will notify a user if someone or something is detected. When it comes to motion sensors, there are many different types with all sorts of technology. Using this technology, they usually are able to notice changes when it comes to radiation, temperature, or vibration [1]. With this product, users would feel safe at home as it would be easy to detect any intruders.

The overall goals that we want to accomplish are:

- We want to create a strong and accurate camera motion sensor system that is quick and can detect over a large area.
- We want to ensure that we pick the best hardware and software for our system so that it can be the best system possible.
- We want to optimize the system so that it has good performance, using methods such as algorithms.
- We want to make a system that is very easy for users of all ages to understand.
- We want to implement different testing methods that can check the accuracy of our system and compare it to other models that may be available.

2 The overall objective of this project is to create an accurate motion sensor device that can outperform the competition. Our company and the stakeholders want us to develop a device that is accurate and quick to respond, while also being modern and safe. In order to achieve this, we need to break down our overall objective into five smaller objectives. **The first objective** is that we want to be able to create a fast responding camera with a wide range. This should be our first priority as it is the main purpose of our product. The camera should alert the users very quickly whenever there are any movements detected. Along with quick response time, we want the camera to be able to monitor the entire environment that it is allocated to [2]. **The second objective** is to add components to our camera that allow it to be accurate. We want the camera to be able to properly scan faces so that it can identify people. Along with identifying people, you can easily use it to determine who is an intruder and who is not [2].

The third objective is to have a wide database that customers can use to store their security videos. If we are able to implement a wide database, the customers will be able to organize their videos and find old clips from the past. This is relevant as they are able to find evidence on the chance that an incident occurs [2]. **The fourth objective** is to provide a user-friendly interface. Since the user will need to implement security codes, it should be simple for them to understand how to start the camera. To make it even easier, we will provide instructions on how to get the device running [2]. **The fifth objective** is to try to keep the overall

production costs below the provided budget. This is an objective because we do not want to lose money on this project, while making the stakeholders happy [2].

3. When it comes to the camera motion sensor system, there are many different ways to measure the success. The **first measure** of success is that we want to be able to have a high detection rate of the camera when we test the accuracy. A high detection rate means that the system will be quickly notified whenever it detects any movement from people or objects. If the rate is quick, then the customers will be able to know right away if something is happening [2]. The **second measure** of success is with the camera quality. Not only should the camera be quick with detecting, but it should also be clear and properly identify the person or thing. This is so that the user would be able to determine if the person or object is safe and trusted. In the case that a situation does occur, a good camera will help record the identity of anyone involved [2].

The **third measure** of success is that the system should contain a functional security database that tracks all movement that is detected. With a fully functional database, the user will be able to save all the videos of detected movement. Using the videos, they could go back and rewatch them in case some incident ever occurs [2]. The **fourth measure** of success is the customer feedback from the stakeholders and customers once the product is released. With the feedback, it should be highly rated. A high rating will mean that they enjoyed the product and are satisfied with what we have produced [2]. The **fifth measure** of success is that the project should not go over budget by the end. If the project stays under the budget, this would mean that it was financially managed well. This leaves the team and investors happy [2].

4. **Infrastructure**

The infrastructure needed to successfully build a camera motion detection system primarily requires the following five components.

1. Camera
2. Database
3. Web Application
4. Security Control Panel
5. Alarm

The security control panel will act as the central element of the motion sensor system. The control panel shall be connected whether wired or wirelessly to each component to allow for communication. This device will be in charge of activating/deactivating the system, triggering alarms, capturing images of detected motion, and uploading these images to a web application. The control panel will need a user interface such as a keypad or touchscreen to allow authorized users to perform actions [1].

The security system will need a loud security alarm to alert any possible intruders or civilians that a intrusion has been detected.

The security camera will be used to capture and record the area in vicinity. The camera may be wired or wireless but must be able to communicate with the control panel [1].

In the case of this specific project, the following three components; camera, security control panel, and alarm will be combined into one device, a laptop [1].

This shall simplify the development of this system as all three components are directly connected to one another. However, it is understood that this provides a significant limitation in a real-life scenario, as with only one camera, the security capabilities of this device significantly falls [1].

A database will primarily be used to store any captured images of movements and any additional data that may be needed by the website. The website shall allow users to have remote access to their security system. Web users will be able to view their cameras, view captured alerts, and turn off the alarms, all remotely [1].

Resources

[1] C. Tholen, “How does a motion detector work?,” *SafeWise*, 10-Jun-2021. [Online]. Available: https://www.safewise.com/home-security-faq/how-motion-detectors-work/. [Accessed: 09-Feb-2023].

[2] K. D'sa, “Considerations for effective and efficient security camera design,” *Construction Canada*, 20-Apr-2014. [Online]. Available: https://www.constructioncanada.net/considerations-for-effective-and-efficient-security-camera-design/. [Accessed: 09-Feb-2023].