## Motus Technical Report

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**Date: Undisclosed**

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# Declaration of Joint Authorship

We, Anthony Pacitto, Dariusz Kulpinski, and Winson Vuong, confirm that this work submitted is the joint work of our group, and no plagiarism has occurred . Any references used in the report will be noted and documented throughout the report. The list of the references used for the report will be included inside the document. For the project Anthony handled the database portion of the project and the app. Dariusz worked on all the physical and hardware portion of the project. And Winson worked on supporting the both of them as an assistant for the project and is working on the app.

# Approved Proposal

# Concluding remarks

# Abstract

The Motus Security System(MSS) is a portable security system that would detect motion in front of the device or movement of the device, and after detecting said motion it would capture an image using the Raspberry Pi Camera apparatus attached directly on the device. The MSS after capturing the image would then send the image to a database, and would then be seen on an Android application. This Technical document for the MSS is used to record our progress, and our findings from our progression throughout the project. The document would record what we as a group did to create the hardware for the MSS. Also, we would describe how exactly managed to create our software for both the Raspberry Pi and also our Android application. Problems we faced will also be included and how we as a group managed to move passed them as a group. The report will also contain our weekly updates to our project that would give insight to how the project was managed as a group, and how we worked together to create this project. The final findings of the project will also be included in this document, and will be recorded as detailed as possible for the sake of proper reporting.

# Illustration List

# 1 Introduction

Motus Security System (MSS) is branded as a portable motion sensor that can be used to detect both physical motion and local vibrations (i.e. tampering or movement of the device) in a 100 degree targeted zone. As mentioned, the software being specified within this document is known as: Motus Mobile and its purpose are to provide the MSS user full control and monitoring of basic input data via the MSS hardware device. The Motus Mobile will also contain a login system for multiple users to use the MSS. The software application provides access to the devices remote database system (i.e. Firebase) which evidently stores all sensor data for interpretation, and also the images captured by the Raspberry Pi Camera. The benefit and overall goal of the application will allow for a user to remotely control their device from any location around the globe in order to ensure greater security, all within an efficient manner. It will monitor information such as, device tampering and movement notifications, surrounding motion detection and image capturing based on where a movement was detected. Additional application settings and preferences will be available which can be modified based on the user’s discretion.

# 2 Project Description

2.1 Problem

# 2.2 Rationale Behind Project

# 2.3 Project Scope

# 2.4 Software Requirement Specifications

# 2.4.1 Database

# 2.4.2 Mobile Application

# 2.4.3 Web Interface

# 2.4.4 Networked Platform Communication Software

# 2.4.5 Microcontroller Firmware

# 2.5 Project Overview

# 2.5.1 Bill of Materials

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# 2.5.3 Mechanical Assembly

# 2.5.4 PCB and Soldering

# 2.5.5 Power Up

# 2.5.6 Unit Testing

# 2.5.7 Production Testing

# 2.6 Problems Encountered

# 2.7 Approaches

# 2.8 Walkthrough of System

# 2.8.1 Microcontroller

# 2.8.2 Microprocessor

# 2.8.3 Server

# 2.8.4 Phone Application

# 2.8.5 Website

# 3. Progress Reports

# 3.1 Report 1

# 3.2 Report 2

# 3.3 Report 3

# 3.4 Report 4

# 3.5 Report 5

# 3.6 Report 6

# 4. Conclusions

# 5. Recommendations

# 6. Technical References

# 7. Appendicies

# 7.1 Microcontroller Firmware

# 7.2 Microprocessor Communication Script

# 7.3 Microprocessor Database Communication Program

# 7.4 Database Input Script

# 7.5 Database Retrieval Script for Phone Application

# 7.6 Website Code

# 7.7 Android Phone Application