SMART ANIMAL SENSOR FOR VEHICLE

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NUR AMIRAH BINTI SHAHADAN

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Computer Network) with Honours.

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FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2021

DECLARATION

I hereby declare that this project report entitled

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is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : NUR AMIRAH BINTI SHAHADAN Date : 9/9/2021

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I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Computer Network) with Honours.

SUPERVISOR : _____ Date : 9/9/2021

([ERMAN BIN HAMID])

DECLARATION

DEDICATION

Especially committed
towards my helpful and supportive friends and sibling, whom always encouraged, lead the right way, motivated myself on my educational journeys.

Special thanks because encouragement from beginning of the start and completion of my project, to my supportive lecturer.

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ABSTRACT

This project is about developing the smart sensor features, including the design of the application interface and the IoT body structure. This project aims to be able to use a smart sensor that can ease the human problem in daily life. All the quality criteria must be included in the system to achieve the project goals. The proper research and study have been developed to get the system to work efficiently and effectively. Other than that, this project also allows me to use my knowledge to make an additional feature to turn into an IoT device. In this project schedule, the most significant that I had to do is the ESP32-CAM set up to ensure the system can be controlled by the developed application. The Smart Animal Sensor for Vehicle relies on the PIR sensor, ESP32-CAM, the application's interface, and other various components. The main focus of this project is to reduce the number of animals killed and ensure user safety while using their vehicle. Besides, the users can control this system wirelessly from the application. This action can ensure safety for both of vehicle and the users.

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ABSTRAK

Projek ini adalah untuk mengembangkan ciri sensor pintar, termasuk reka bentuk aplikasi dan struktur reka bentuk IoT. Projek ini bertujuan untuk menggunakan sensor pintar yang dapat mengurangkan masalah manusia dalam kehidupan seharian. Semua kriteria yang berkualiti mesti dimasukkan ke dalam sistem untuk mencapai matlamat projek. Penyelidikan dan kajian yang tepat telah dijalankan agar sistem berfungsi dengan cekap dan berkesan. Selain itu, projek ini juga membolehkan saya menggunakan ilmu pengetahuan untuk membuat sistem telah dirancang berubah menjadi peranti IoT yang baik. Dalam jadual projek ini, hal yang paling penting yang harus saya lakukan adalah pemasangan ESP32-CAM di mana untuk memastikan sistem dapat dikendalikan oleh aplikasi yang telah dibina. Smart Animal Sensor for Vehicle bergantung pada sensor PIR, ESP32-CAM, reka bentuk aplikasi dan komponen lain yang terlibat. Fokus utama projek ini adalah untuk mengurangkan bilangan haiwan yang terbunuh dan memastikan keselamatan pengguna semasa menggunakan kenderaan mereka. Selain itu, pengguna dapat mengendalikan sistem ini secara tanpa wayar dari aplikasi. Tindakan ini dapat menjamin keselamatan kenderaan dan pengguna.

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Smart Animal Sensor for vehicle is necessary to detect the presence of animals entering the vehicle engine. This system is also capable of notifying the owner of the vehicle through the developed application if there is a presence of animals. It is because the animals such as rats, cats, and others love to stay in the car engine as their shelter to keep warm and safe, especially at night and rain. The small and compact spaces in an engine block are the best refuge from the cold weather and predators. An engine also stays warm for a while after it has been shut off, and this heat can entice the animals to climb into the engine. Sometimes these animals will enter and leave without the user ever knowing, but they can accidentally cause damage that can be obvious and severe. Besides, as the engine starts, it can cause injury and death to the animal that is using it for the shelter of animals.

Moreover, there are few features that will be added to the system, which is the camera has been used so that the user can monitor from everywhere. And, if the sensor has detected the presence of animals, it will send the notification to the users via the Blynk application. By adding these features, it will increase the security of the vehicle and will prevent any damage to the engine.

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1.2 BACKGROUND

When the animals stay in the vehicle, there are a lot of problems that occur where it is inconvenient for many vehicle users. One of the problems is the animals such as rats, cats, and others love to stay in the car engine as their shelter to keep warm and safe, especially at night and rain. When the engine started, it can get the animals injured and killed while staying at the car engine. Other than that, these animals can cause damage to the vehicle, such as electrical, air-condition, heating, and sanitary problems for the vehicle, which are the electrical shorts caused by the wires that are chewed. Moreover, these animals can cause health problems to the users as the animal urine can increase the chance of disease transmission.

Due to this problem, a smart sensor will be developed into this system as it can help to detect the animals when they are in the car engine.

1.3 PROBLEM STATEMENT

In this section, there are the problem that occur which lead into developing this system. The description for the problem will be explained in the Table 1.

Table 1: Problem Statement Summary

PS	Problem Statement
PS_1	The users does not notice when animals staying in the vehicles.
PS_2	The project limit to the one type of vehicle.
PS_3	The ability to understand how the system works.

1.4 PROJECT QUESTION

In this section, there are some project question has been stated based on the problem statement. The description for the project question will be illustrated in Table 2.

Table 2: Project Question Summary

PQ	Project Question
PQ_1	How to alert the users when animals staying in the vehicles?
PQ_2	What is suitable medium that can fit to all type of vehicle?
PQ_3	How to make users understand the way system works?

1.5 PROJECT OBJECTIVE

In this section, the project objective will be explained which to lead the project to be successful develop in order to achieve its goals. The description for project objective will explained in Table 3.

Table 3: Project Question Summary

PS	PQ	PO	Project Objective
PS	PQ	PO_1	To design the smart sensors that could alert the users when animals in vehicles.
		PO_2	To develop the system that suitable to all type of vehicle engine structure.
		PO_3	To test the system that easier to user understand.

1.6 HYPOTHESIS

In hypothesis, the users do not notice when animals staying in the vehicle is one of the main problems for this project. In order to overcome this problem, a smart sensor equipped with a monitoring system will be developed, which is a suitable camera will be used that users can monitor from smartphones. Other than that, a PIR sensor will be used which is to detect animal movement in a required range. Next, the alert notification will be included that it will send the notification through Blynk.

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1.7 IMPORTANCE OF PROJECT

The importance of the project is to ease many vehicle users by reducing the problems that occur to them, such as damage in the vehicle produce by animals. Other than that, it can minimize user's effort, which is this system communicate with each other and do a lot of task for us, for example, notify the users when the sensor has detected the animals that the users do not need to check their vehicle when they want to use it. Moreover, this project also improves the security of the vehicle as it was

equipped with a smart sensor that can detect the animals when they jumped into the vehicle.

1.8 PROJECT SCOPE

1. The platform will be used is ESP32-CAM with an integrated WiFi module.

2. Users must know how to interact with the computer or the product.

3. The HCI will be used is Blynk application in mobile phone.

1.9 PROJECT SIGNIFICANT

In this section, the project significant will explain the significant of the project based on the problem statement and project objective. The description will explained in Table 4.

Table 4: Project Significant Summary

PS	PQ	PO	Project Significant
PS	PQ	PO_1	Can reduce the number of animals killed.
		PO_2	The system can applied to various type of vehicle.
		PO_3	Ease the users to use the system.

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1.10 CONCLUSION

In conclusion, this chapter begins with an introduction to the background of the study, which is it describes the specific research such as objectives, problem statement, scope, and project question. This project work on the studies and analysis of how the implemented system can help to reduce the problem stated, which is to reduce the number of animals get killed while staying in the car engine and also to prevent damage to the car engine. Developing this project, it can make life easier for users, which is the system can help to reduce the problem occur.