



Faculty of Electrical and Electronic Engineering Technology



DEVELOPMENT OF SMART ANIMAL TRAPPING SYSTEM

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**Bachelor of Electronics Engineering Technology (Industrial Electronics) with
Honours**

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DEVELOPMENT OF SMART ANIMAL TRAPPING SYSTEM

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**A project report submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Electronics Engineering Technology (Industrial Electronics) with
Honours**



Faculty of Electrical and Electronic Engineering Technology

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DECLARATION

I declare that this project report entitled “DEVELOPMENT OF SMART ANIMAL TRAPPING SYSTEM“ is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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APPROVAL

I hereby declare that I have checked this project report and in my opinion, this project report is adequate in terms of scope and quality for the award of the degree of Bachelor of Electronics Engineering Technology (Industrial Electronics) with Honours.

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DEDICATION

This research is dedicated to my respective parents, Hashimah Binti Abu Hassan and Mohd Isman Bin Illias, who has inspired me throughout my lives. They have equipped me with their discipline and motivation necessary to approach a task with enthusiasm and determination. This project would not have been possible without their love and support.



ABSTRACT

Animal traps have been implemented by man, especially primary organized the first hunts. Along with the development of hunting art, traps gradually gave way to specialized hunting weapons. Animal Trapping is the use of device to remotely catch an animal. Animals may be trapped for a variety of purpose such as food, fur trade, hunting and pest control. The pest animal such as mouse can spread dangerous disease such as hantavirus, salmonella and others that dangerous to human lives. The report main reason are to reduce or control the number of pest that increasing such a great amount in each year. The main focus of this project is to create animal trapping and monitoring system using mobile application. The user can fully control the trap system to catch or released the mouse without touching it by using smart mobile phone. By creating this smart animal trapping system, it can replace old or conventional animal trap that need user to rid the animal manually. From this objective, we can see the advantage of the new system that can help reduce the case.

ABSTRAK

Perangkap haiwan telah lama wujud di sisi manusia, sejak zaman pra-sejarah memburu haiwan dalam keadaan yang teratur dan strategik. Sepanjang perkembangan era seni pemburuan, perangkap telah mengalami revolusi digunakan khas untuk memburu haiwan. Perangkap haiwan digunakan untuk menangkap haiwan daripada jarak jauh. Haiwan mungkin terperangkap dengan pelbagai tujuan sebagai makanan, bulu, pemburuan dan kawalan perosak. Haiwan perosak seperti tikus boleh menyebarkan penyakit berbahaya seperti hantavirus, salmonella dan lain-lain yang berbahaya dan boleh mengancam nyawa manusia. Tujuan utama projek ini, adalah untuk mengurangkan atau mengawal jumlah haiwan perosak yang semakin meningkat jumlahnya pada setiap tahun. Objektif projek ini adalah untuk mengembangkan sistem perangkap dan memantau haiwan tersebut menggunakan aplikasi mudah alih. Pengguna dapat mengawal sepenuhnya sistem perangkap untuk menangkap atau melepaskan haiwan itu tanpa menyentuhnya dengan menggunakan telefon bimbit. Dengan membuat sistem perangkap haiwan pintar ini, ia dapat menggantikan perangkap haiwan yang lama atau konvensional yang memerlukan pengguna untuk menyingkirkan haiwan itu secara manual. Dari objektif ini, kita dapat melihat kelebihan sistem baru yang dapat membantu mengurangkan kes tersebut.

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LIST OF SYMBOLS

δ	-	Voltage angle
μ	-	Micro



LIST OF ABBREVIATIONS

V	-	Voltage
Ω	-	Ohm
I	-	Current



CHAPTER 1

INTRODUCTION

1.1 Background

Animal Trapping system is common thing in our society. The first patented mousetrap was a spring-loaded called 'Royal No 1'. It was patented on 4 November 1879 by James M. Keep of New York, USA. This mousetrap special traits to capture and kill the mouse only. Mousetraps are typically placed in areas where rats are thought to be located. These old mousetraps have several disadvantages for example the user need to touch the mouse in order to remove it from the trap and if the mouse has fatal diseases the user will be affected simply by touching the mouse. To overcome this unfortunate situation, smart animal trapping system was created to help user to capture and get rid the mouse without touching it because it have a system that allowed user to control using mobile phone.

1.2 Problem Statement

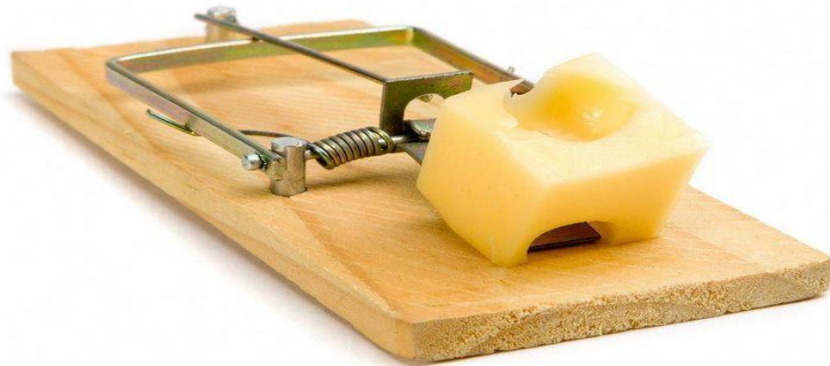


Figure 1 Wooden Mouse Trap

Rats are urban pests that have long been associated with a variety of diseases that can affect humans. People nowadays tend to getting rid of rats by trapping and baiting, use snap-style traps which are designed to kills rats quickly based on Figure 1 and Figure 2. These mouse traps based on Figures 1 and 2 had a flaw because when the rats die, they emit a foul odour that attracts other rats nearby, and the rats carry several deadly diseases that can be transmitted to humans when we touch them.



Figure 2 Metal Cage Mouse Trap

Moreover, people also used chemical methods to get rid of the rats based on Figure 3 and it can lead to environmental pollution. A smart animal trapping system can overcome these flaws by using IR sensor that can detect a movement of the rat and restrict its movement without hurting the rat. By using Blynk app, a mobile phone receives notification and gets trap door controls. The user must however access the telephone for trap control because the telephone is controlled by a single system, which mainly uses Nodemcu. The range for the information to be sent to the user smart phone are limited and the user must be near the trap and have decent connection internet to get the notification.



Figure 3 Chemical Glue Mouse Trap

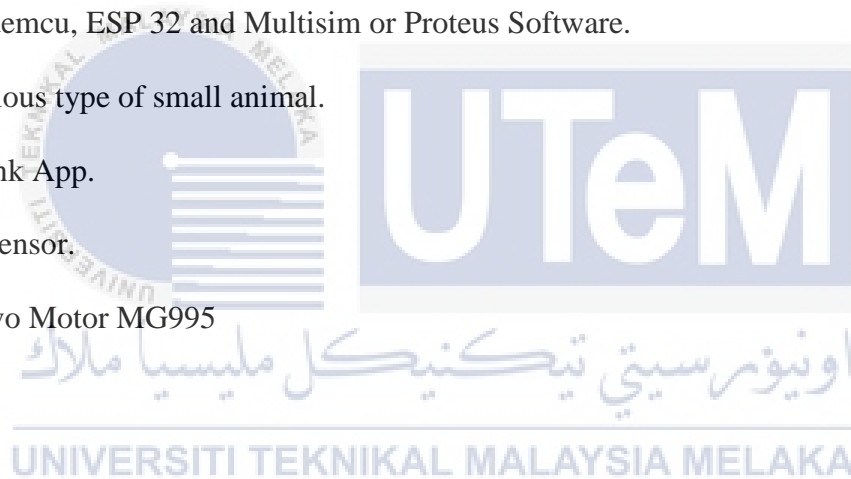
1.3 Project Objective

These are the following objective based on this project:

- i. To develop smart animal trapping and monitoring system using mobile application
- ii. To design new version animal trapping system to replace conventional mouse trapping system.

1.4 Scope of Project

- a) Nodemcu, ESP 32 and Multisim or Proteus Software.
- b) Various type of small animal.
- c) Blynk App.
- d) IR sensor.
- e) Servo Motor MG995



CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Animal traps have always been accompanied by man, the first hunts organized by the primary. The use of a device to remotely capture an animal is animal trapping including food, the fur trade, pesticide control, or animal welfare management, may be trapped for a variety of purposes. Trapping for animal's resources and food remain an important economic and cultural activity, especially in some communities. However, in still developed countries such as Malaysia, Conflict between human and wildlife is on the rise. This leads both in urban and rural areas to an increasing need for wildlife control. Trapping is an important tool for this purpose. Modern trapping respects the welfare of animals with new purpose, cost-effective way to catch animals without damage. The animal trap using sensor is more suitable trap that can be used in this modern era. These modern trap using sensor as main component to detect and restrict any animal movement only without hurting the animal. Animal trap using sensor also can be controlled with mobile phones; users also can get notification through their smartphone too. We can guarantee that this system is friendlier towards the animals that have been captured without killing or hurting them.

2.2 Hardware

2.2.1 Camera

A camera is a lightproof chamber having an aperture coupled with a lens and a shutter through which light is directed onto a surface for recording 'as on a photosensitive film or an electronic sensor' or translation into electrical impulses. The esp 32 camera is used in this project as a live video source that can be viewed directly on the phone.

2.2.2 Servo Motor



Figure 2.1 Servo Motor

It is important that some industrial project can operate by a servo engine based on the author. Servo motors based on Figure 2.1 are electronic devices and linear or rotating actuators that can rotate and push machine elements precisely based on Figure 1. Servo motor an electric signal that controls the engine and determines the amount of movement indicating the control position of the shaft. Servos are used primarily for controlling angular or linear position, speed and acceleration.[1]

2.2.3 Voltage Booster



Figure 2.2 Voltage Booster

By referring to this author, the voltage booster simply converts amps to volts. A voltage booster is simply a device that converts amps to volts based on Figure 2.2. Because the breaker at the pole controls the maximum amount of power users can draw, it would be impossible to "take" more power than the park has allotted. Voltage Booster Circuit created with Texas Instruments' LM2698. The IC LM2698 is a 1.35A Boost Regulator with a simple switcher. Converts from 3.3 V to 5 V and 5 V to 12 V. The LM2698 is a PWM boost converter that can be used for a variety of applications. [2]

2.2.4 NodeMCU

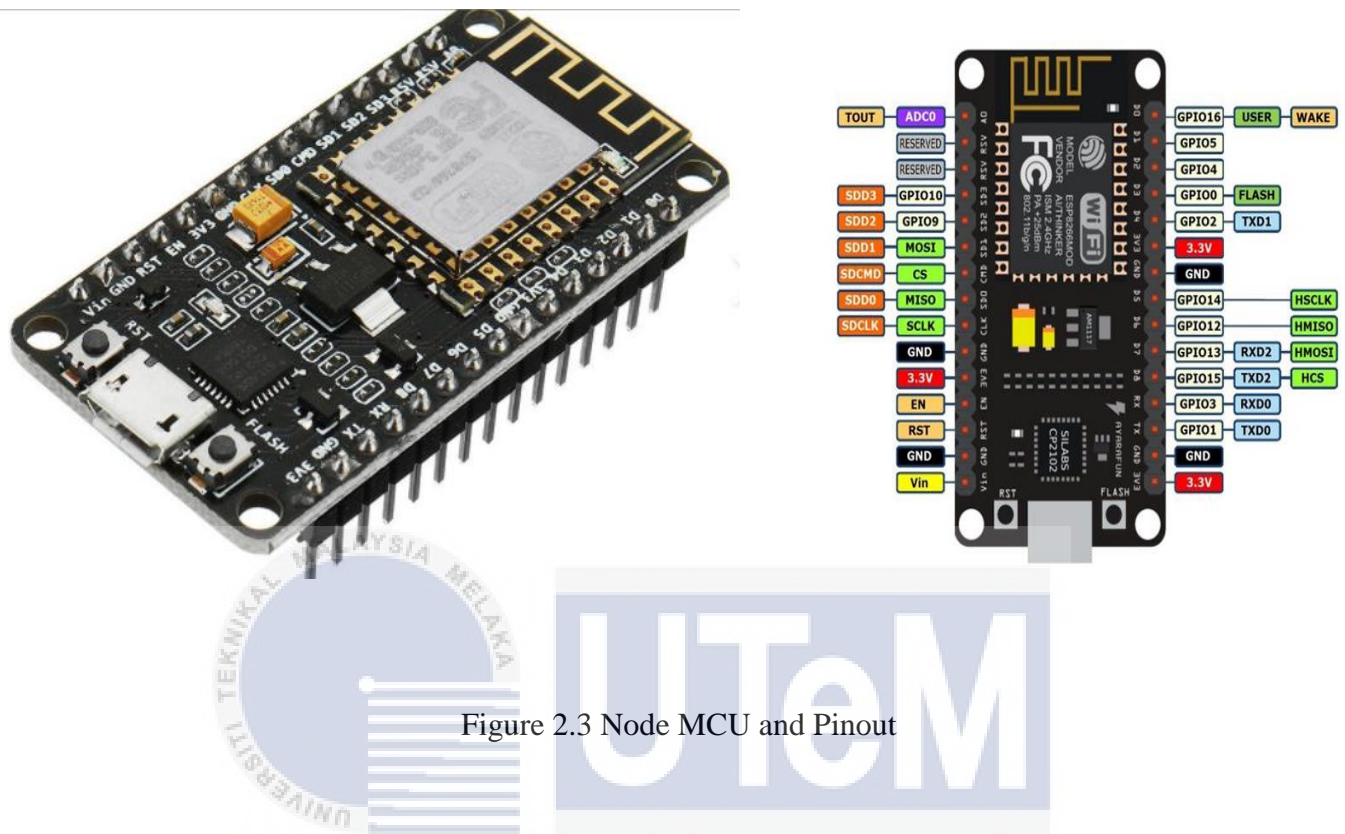


Figure 2.3 Node MCU and Pinout

Based on author, The NodeMCU ESP8266 based on Figure 2.3 the board includes the ESP-12E module, which contains the chip, which is powered by a Tensilica Xtensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and operates at an adjustable clock frequency of 80MHz to '160MHz'. To store data and programmes, NodeMCU has 128 KB of RAM and 4MB of Flash memory. Its high processing power, combined with built-in Wi-Fi or Bluetooth and Deep Sleep Operating features, makes it ideal for IoT projects. The NodeMCU is powered by a Micro USB jack and a VIN pin (External Supply Pin). It has UART, SPI, and I2C interfaces.[3]