FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITI TEKNOLOGI MARA

MALAYSIA

REAL-TIME MONITORING WILDLIFE USING AUTOPILOT QUADCOPTER WITH WI-FI FACILTY (CAMERA TRAPPING AND ROUTER EXTENDER)

This thesis is presented in partial fulfilment for the award of the

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FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITI TEKNOLOGI MARA

MALAYSIA

MOHAMAD SHAHAFIZUL BIN ABDULLAH@AZIZ

2013497096

FACULTY OF ELECTRICAL ENGINEERING

UNIVERSITI TEKNOLOGI MARA

40450 SHAH ALAM, SELANGOR DARUL EHSAN

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ABSTRACT

From the THE STAR newspaper 14th April 2015, at least five of Malaysia's mammal species, including the Sumatran Serow, dugong and the Malayan tiger are now facing extinction [1]. This is due to human activities such as logging, over-development and poaching [1]. In Malaysia, there are no advance system or method that can monitor the wildlife more efficient and effectively. Some conventional methods include surveys on the footprints, dung, calls, live trapping, den counts and direct observation [2]. The problem of these methods, there are no technologies on wildlife monitoring system that can visually monitor during real-time on illegal activities in remote locations [3]. On top of that, the information need to be informed quickly when illegal incidents occurred in the forest so that the relevant authorities can be assigned to stop the illegal activity. The objectives of this projects is to design a system for real-time monitoring using smartphone application, to develop a system that can provide WI-FI signal at any place in the forest for faster data collection and to design the night vision monitoring system and to extend the WI-FI signal coverage. This project is a real-time monitoring wildlife which uses an autopilot quadcopter and provides WI-FI facility for the forest rangers or to the jungle trekkers. The design implementation that are carried out is by applying Monitoring tools using high definition camera with WI-FI supported and night vision capable and Global Positioning System(GPS). The system is capable to improve the monitoring work in the jungle and also improves care control on wildlife effectively. This project will be beneficial to the Wildlife Conservation Society as to monitor the wildlife in large area during real time and provide WI-FI facilities for the forest rangers and jungle tracker.

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW OF THE STUDY

Data from the World Bank showed that 70 of Malaysia's 336 mammal species were threatened as of 2014, the seventh highest in the world in this category [4]. In South-East Asia, Malaysia is second only to Indonesia, which has 184 endangered mammal species, making it the number one in the world. Although the World Bank does not say why, it is presumed that many mammals worldwide are dying out due to human activities such as logging, over-development, and wildlife trafficking and poaching [5].

There are a variety of methods for monitoring wildlife that had been used in various countries. Firstly, observers spend hours in the field recording data about wild animals. Secondly, Aircraft are used in some parks to count large mammals such as elk, deer, and seals. Thirdly, Radio-telemetry, radios attached to individual animals, can be used to track animal movements, determine home range size and offer information on habitat use [6]. Fourth, Remote cameras can offer information about presence of wildlife species, numbers of individuals, behaviours and habitat selection.

Wildlife viewing cameras are used worldwide to address a variety of research and management objectives for many wildlife species. They are an effective tool for investigating wildlife behaviour, and documenting species presence and distribution [7]. But the disadvantage of this method is the forest ranger need to self-collect of each of the data on each camera. Walking along transect will gives an extremely challenging of the forest ranger to collect the data.