AERIAL SCOUT OF QUADCOPTER UNMANNED AERIAL VEHICLE (UAV) FOR SEARCH AND RESCUE (SAR) MISSION

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ABSTRACT

Throughout this technical report, it will briefly describe the final year project of Aerial Scout Using Quadcopter Unmanned Aerial Vehicle (UAV) For Search And Rescue (SAR) Mission. The purpose of this work is to assist the work of search and rescue parties and increase the efficiency of search and rescue mission. The Quadcopter is operated using four brushless motor controlled by the latest flight controller technology which is equipped with mobile application to assist the drone operation. The Quadcopter consists of four combined system: flight maneuver system, live video feed system, camera and global positioning system (GPS) messaging system, and mobile application system. The system also use four different types of operating frequencies, 2.4GHz for flight Radio system, 413MHz for transmitting telemetry data, 5.8GHz for video feed and 915 MHz for mobile messaging application. From the experiment, it shows that the quadcopter is capable flying for 1.8km radius and the Quadcopter operator is fed with live video and can trigger the camera and GPS messaging system whenever target has been spotted. The Quadcopter will send the GPS coordinate message and capture the picture for further analysis to search parties. From that data, Search and Rescue parties are able to analyze and take necessary action for better mission.

CONTENTS

CHAPTER I

INTRODUCTION

1.0   Background Study

The Unmanned Aerial Vehicle (UAV) or better known as Drone is an emerging technology since five years ago. There are three type of drones exist to this day, the multirotor helicopter, the fixed wing aircraft and wingcopter. For this project, multirotor quadcopter type is selected. The advantages of quadcopter are [1]:

- Stable vertical flight or hover,
- Short blades are much easier to construct,
- Greater Manoeuvrability in tough condition or weather,
- Easy to operate.

Although the quadcopter is simple to pilot, the vehicle depends heavily on various types of sensors. The sensors are used to ensure that stable flight and to reduce the error due to drone operator. The drone is controlled by autopilot electronics system called Flight Controller (FC). The flight controller (FC) controlled all 4 motors to manoeuvres in desired direction.

Because of Unmanned Aerial Vehicle (UAV) are so maneuverable, the quadcopter can be useful in all kinds of situations and environments. One of application is Search and Rescue Mission.

Search and Rescue (SAR) is the search for and provision of aid to people who are in distress or imminent danger [2]. It is involve the use of aircraft, surface craft,