ABSTRACT

Drones are a promising technology for parcel delivery since they are cost-effective, speedy, and environmentally benign. The usage of autonomous delivery drones is a more recent way of delivery. The goal is to use an unmanned aerial vehicle to deliver packages to a specific location, boosting delivery efficiency and reducing human effort. Delivery Drone is an aircraft without a human pilot on board. Its flight is controlled autonomously through software-controlled flight plans in their embedded system working in conjunction with onboard sensors and GPS. It significantly accelerates delivery times and reduce the human cost associated with the delivery.

This requires electronic speed control [ESC] to regulate the speed of the motor, as well as a global positioning system [GPS] to control the drone's longitudes, latitudes, and elevation points. The key originality of this study is the implementation of obstacle avoidance and the placement of charging stations where the battery can be charged or replaced.

CHAPTER 1

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1.1 OVERVIEW

One can say robotics is the future and drones play an important role in that. The BOT makes human life much organized and simpler. Drones are one such promising tool which sets its foot in many applications. This Autonomous unnamed aerial vehicle (UAVs) operates using "Artificial Intelligence" method i.e., has a capacity to do task that are usually done by humans which is controlled by computer. This hexacopter drones do not require a human pilot. From taking off and landing to carrying out aerial site inspections and surveying, these aircrafts complete tasks and make decisions on their own. This bots use "Machine Learning" which is a special language that generally allows software application to become more accurate at predicting outcomes.

Companies around the world are gearing up to roll out drones for use in parcel delivery. Many countries and companies have merged their first deliveries by way of drones with flights seen in Africa, Australia, Europe and the United States, conducted by large companies such Google, Amazon, UPS and DHL. Their approach uses a genetic algorithm to determine the optimal routing configuration, which can be calculated in half a minute. Outside of the mathematics-focused side of the field, work is also being done in improving the operational performance of the drones. One group of researches has been tackling the issue of battery power management, as the battery output behavior is not linear, and it cannot precisely be known how much energy is left for the drone to use for flight. In particular, a drone departs from the depot, and/or flies freely to the customer, drops off the parcel, and returns to the depot.

1.2 OBJECTIVES

- To design an autonomous delivery drone system.
- To deliver the packages autonomously the drone without human effort.
- To reduce the time consumption and fuel consumption.
- To implement charging station for charging or replacing the battery.

1.3 MOTIVATION

- To achieve perfect flying and delivering mechanism we see several advancements in drone technologies, we observe the battery's output, managed to improve the reliability of battery readings by 16%. One method is to position charging stations [12]–[16], such that drones can charge their battery or replace the battery to prolong the flight.
- For avoiding use of trucks for these parcels, a possible way is to enlarge the delivery area

and establishing small warehouse for quick access to ordered packages.

- For the autonomous behavior we use the ground system (Mission Planner) which maintains the range of the auto pilot. This is done through telemetry which allows real time communication and information in the form of data stream.

1.4 ORGANIZATION OF THE REPORT

Organizing our report into seven chapters, along with their corresponding sections and sub-sections. A brief description of various chapters is as given below:

CHAPTER 1: This chapter constitutes the introduction of the proposed system and the objectives of the proposed system.

CHAPTER 2: This chapter includes the survey on various literature sources available which gives a basic idea of the development, design and implementation aspects along with the history and evolution of the proposed system.

CHAPTER 3: This chapter describes the proposed system along with block diagram and the explanation of the various blocks which make up the system.

CHAPTER 4: This chapter includes the hardware and software description which briefs about all the components used along with the software support.

CHAPTER 5: The results obtained by implementation of the proposed system is given in detail in this chapter.

CHAPTER 6: This chapter consists of the advantages, disadvantages and the applications of the proposed system.

CHAPTER 7: The conclusion and the future scope of the proposed system is briefly discussed in this chapter.