



Criminal Detection Drone

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Abstract— Due to rise in crime in country the person recognition is important in public area. Drones will solve the problem by exploring the transport opportunities in vertical dimension above the road. This paper discuss about the design of scalable delivery drone which includes flight efficiency, energy consumption, noise, and safety are the key parameters in delivery viability. This paper discuss about the design and implementation of a Quadcopter based system for the delivery operations and surveillance operations using a camera. A quadcopter can achieve vertical flight in a stable manner and be used to monitor or collect data in a specific region such as Loading a mass. Technological advances have reduced the cost and increase the performance of the low power microcontrollers that allowed the general public to develop their own quadcopter. The goal of this project is to build, modify, and improve an existing quadcopter kit to obtain stable flight, gather and store GPS data, and perform autocommands, such as auto-landing. The project used an Aeroquad quadcopter kit that included a frame, motors, electronic speed controllers, Arduino Mega development board, and sensor boards and used with the provided Aeroquad software. Batteries, a transmitter, a receiver, a GPS module, and a micro SD card adaptor were

interfaced with the kit. The aeroquad software was modified to properly interface the components with the quadcopter kit. Individual components were tested and verified to work properly. Currently, the quadcopter can properly stabilize itself, determine its GPS location, and store and log data. Most of the goals in this project have been achieved, resulting in a stable and maneuverable quadcopter

Keywords— **Quadcopter, Camera, BLDC, GPS**

I. INTRODUCTION

At present drones can be used in a wide range of commercial applications. A camera equipped drone is used to map an area, to protect border areas from intruders, to gather intelligence information on the battlefield, to take photos and videos of buildings, construction sites and ground areas. Many companies like Amazon are using drones to deliver their goods. Unmanned Aerial Vehicle (UAV) also known as a drone is a remote-controlled

aircraft. It can be operated remotely in real time or pre-programmed to fly autonomously on the pre-defined routes. Quadcopter is an Unmanned Aerial Vehicle (UAV) which has a capability of vertical take-off and landing at a point. Drones are available as fixed wing or Rotary wing. The fixed wing craft has high speed and heavy load capability, but it cannot stay at a point in mid-air. Whereas rotary wing craft can take-off vertically and can be held at a point. Rotary wing model, will produce three rotary motions about X, Y and Z axes are known as pitch, yaw, and roll respectively and two forces to provide linear motion as shown in Fig.1. The Quadcopter has four rotors in which the contradictory end rotors must rotate in the same direction and the other end in the same direction. Quadcopter is used for carrying payload and crowd monitoring applications. An Unmanned Aerial Vehicle (UAV) is an air-craft without a human pilot aboard. Its flight is controlled either autonomously by onboard computers or by the remote control of a pilot on the ground or in another vehicle. The QC an emerging UAV is lifted and propelled by four rotors. It has good maneuverability with limitless applications. Departing from a century old design, modern QCs are evolving into small and agile vehicles. After already proving their usefulness as aerial imaging tools, new research is allowing QC

to communicate perceptively with other autonomous vehicles, to explore unknown environments and to maneuver in dense surroundings with speed and precision. Individually, these advances will allow QC to complete missions such as long term surveillance and search and rescue. However, if all of these developing technologies are combined, quad rotors will be capable of advanced autonomous missions that are currently not possible with any other vehicle. This paper shows details and usages of a QC as weight lifter which is capable of making a path using Global Positioning System (GPS) for delivering parcel ordered by online.

II. LITERATURE SURVEY

[1] **Etienne Oehmichen** was the first scientist who experimented with rotorcraft designs in the 1920s. Among the six designs he tried, his second multicopter had four rotors and eight propellers, all driven by a single engine. The Oehmichen used a steel-tube frame, with two-bladed rotors at the ends of the four arms. The angle of these blades could be varied by warping. Five of the propellers, spinning in the horizontal plane, stabilized the machine laterally. Another propeller was mounted at the nose for steering. The remaining pair of propellers was for forward propulsion. The aircraft exhibited a considerable degree of stability and controllability for its time, and made more than a thousand test flights during the middle 1920s. By 1923 it was able to remain airborne for several minutes at a time, and on April 14, 1924 it established the first-ever FAI distance record for helicopters of 360 m. Later, it completed the first 1 kilometer closed-circuit flight by a rotorcraft.

[2] After Oehmichen, Dr. George de Bothezat and Ivan Jerome developed this aircraft, with six bladed rotors at the end of an X-shaped structure. Two small propellers with variable pitch were used for thrust and yaw control. The vehicle used collective pitch control. It made its first flight in October 1922. About 100 flights were made by the end of 1923. The highest it ever reached was about 5 m. Although demonstrating feasibility, it was, underpowered, unresponsive, mechanically complex and susceptible to reliability problems. Pilot workload was too high during hover to attempt lateral motion.

[3] **Convertawings Model A Quadrotor** (1956) was intended to be the prototype for a line of much larger civil and military quadrotor helicopters. The design featured two engines driving four rotors with wings added for additional lift in forward flight. No tail rotor was needed and control was obtained by varying the thrust between rotors. Flown successfully many times in the mid-1950s, this helicopter proved the quadrotor design and it was also the first four-rotor helicopter to demonstrate successful forward flight. Due to a lack of orders for commercial or military versions however, the project was terminated. Convertawings proposed a Model E that would have a maximum weight of 42,000 lb (19,000 kg) with a payload of 10,900 lb (4,900 kg).

III. OBJECTIVES

- Remotely monitor public area
- Provide security
- Reduce costtime.

IV. METHODOLOGY

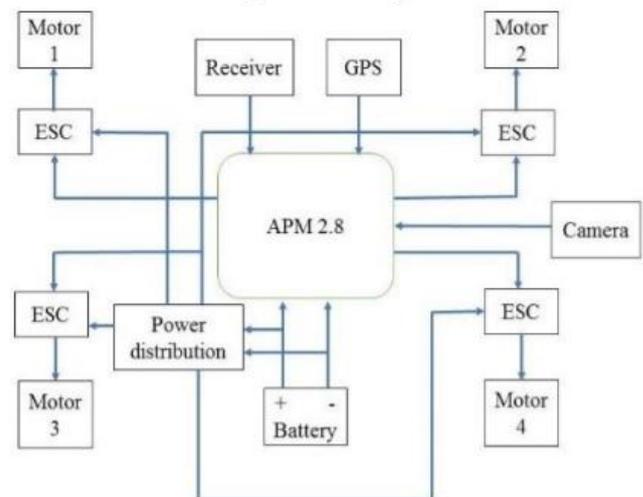


Fig:- System Architecture

This work proposed a methodology to detect various entities in a video. Figure 2 shows the block diagram of the methodology and phases involved in the proposed security and surveillance system. The proposed system consists of the following main phases: Data acquisition/collection of the data set containing the instances of entities to be detected. Next, the preprocessing phase transforms the images into reduced features for efficient processing and the Training Phase for model building. The fourth phase consists of Query Image entity prediction, in which query image is processed and presented to a trained model for the prediction of potential. Following is a detailed description of each phase.

CNN is basically a field of deep learning. It enables the machines to view the world as humans do, recognize it in the same way and even use the knowledge for task like image recognition, classification. It takes an input image. The input image is given as input to the first layer that is convolutional layer. It assigns importance (weights and biases) to various aspects in the image and be able to differentiate one from the other. The pooling layer in CNN reduces the size of the image into a form which is easier to process without losing features. It is used for extracting dominant features. The convolutional layer and pooling layer together form nth layer of

CNN. The fully connected layer flattens the image into column vector. It is fed to feed forward neural network layer after this model is able to distinguish between low-level features in the image. From these features extracted the image is detected and recognized based on the training data set provided. CNN contains number of hidden layers. The count of hidden layers depends on the image complexity. In our previous paper, we studied about convolutional neural networks and the working of drone. By bringing together convolutional neural networks and UAVs, we could develop a smart tool for surveillance which will be capable of detection and recognition of various objects, weapons face of people based on the training data set given.

V. CONCLUSIONS

This project has presented an IoT based smart energy management system. An Electronic Meter Automation Device has been developed which can be mounted on an old meter. This device mounting on to the old meters can make them act as smart meter. A webpage and smart App has been developed. The meters can be easily accessed through customized web pages, smart App and then notification can be sent using SMS. Meters can be turned ON and OFF automatically once a user exhausts its prepaid threshold value or through the smart App. Large-scale data collection is in the process and in future we plan to deploy few smart meters in locality apart from the university to see the real household response of our system.

VI. FUTURE SCOPE

New applications are coming into picture as the work efficiency and tolerance capacity of the drones have surpassed all expectations. Recently India has also joined the picture by releasing its own drones. We can use our drone attached with camera for surveillance of MIT Campus. Developments and modifications are constantly being done on the structure and internal electronics. The new "helicopter drone" released by the US army carries a 1.8 giga pixel camera to

provide clear ground images even from high altitudes. The sensors carried in the drones are also being made sharper to provide higher aerial surveillance. Programming software of the drone is being developed such that the drone can take its own decision in situations where human error is probable. The USA has constantly been utilizing their fleet of drones over Pakistan and Afghanistan in the fight against terrorism. Drones have always risen to the occasion whenever they were needed. They are truly an engineering spectacle, containing the best of mechanical, electronics and software technology. There just might be a day when today's generation tells their grandchildren that aircrafts were manned by human pilots.

VII. ACKNOWLEDGEMENT

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