International Journal of Enhanced Research in Science, Technology & Engineering
ISSN: 2319-7463, Vol. 11 Issue 7, July-2022, Impact Factor: 7.957

# Using Drone to Recognise Face Detection and Movements

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**ABSTRACT**

**Unmanned aerial vehicle (UAV) swarms provide situation awareness in tasks such as emergency response, search and rescue, etc. However, most of these scenarios take place in GPS- denied environments, where accurately localizing each UAV is challenging. Heterogeneous UAV swarms, in which only a subset of the drones carry cameras, face the additional challenge of identifying each individual UAV to avoid sending position updates to the wrong drone, thus crashing. The design and construction of the quadcopter are done from scratch because we need the UAV for adapt to our requirements.**

**Key words: UAV, Face recognization, Environment**

## INTRODUCTION

The past few years have seen the implementation of automated facial recognition systems across a range of social realms. While these technologies are associated most frequently with promises to strengthen public safety, a growing number of other applications have also emerged – from verifying the identity of bank users, through to 'smart billboards' that display advertisements in response to the moods of passers-by.Due to its large field view in the sky, drones are widely used in various areas such as forestryresearch, traffic motion route analysis, surveillance or monitoring , aerial delivery system, and especially in various scenarios where object detection was the primary task, such as people and vehicle detection, human head counting, and people re- identification widely usedDrones. Face recognition developed from traditional hand-craft feature methods to deep learning techniques. Usually, it consisted of following four steps: face detection, face alignment, face representation, and facematching.

## DRONE COMPONENTS

### i) Frame

- It should have sufficient strength to hold the propeller momentum and additional weight for motors and cameras
- Sturdy and less aerodynamic resistance

### ii) Propellers

- The speed and load liftingability of a drone dependson shape, size, andnumber of propellors
- The long propellors create huge thrust to carry heavy loads at a low speed (RPM) and less sensitive to change the speed of rotation.
- Short propellors carry fewer loads. They change rotation speeds quickly and require a high speed for more thrust.

### iii) Motor

- Both motors brus less andbrushed type can be used for drones
- Brushed motor is less expensive and useful forsmall-sized drones
- Brushless type motors arepowerful and energy veryefficient. But they needElectronic Speed Controller (ESC) to control their speed. These brush less motors are widely used for racing freestyle drones, traffic survey and aerialphotography drone.

**iv) ESC (Electronic SpeedController)**

- ESC is used to connectthe battery to the electric motor for power supply
- It converts the signal from the flight controller to revolution per minted (RPM) of motor
- ESC is provided to eachy motor of the drone

**v) Flight Controller (FC)**

- It is the computer processor which manages balance and telecommunication controls using different transmitter
- Sensors are located inthis unit foraccelerometer, barometer, magnetometer, gyrometer and GPS
- The distance measurementcan be carried out by ultrasound sensor
- Radio Transmitter sends the radio signal to ESC topilot to control motor speed.
- Radio Receiver: Receivedthe signal from the pilot. This device is attached to the quadcopter

**Vi ) Battery**

- High-power capacity,Lithium Polymer (LiPo) are used for most drones.The battery can have 3S (3 cells) or 4S (4 cells

**Vii) TRANSMITTER**


- A Drone Radio Transmitter is an electronic device that uses radio signals to transmit commands wirelessly via aset radio frequency over to the Radio Receiver, which is connected to the drone being remotely controlled

REAL TIME HARDWAREIMAGE:

Major forces acting on a Drone When a drone moves in the air, various forces act on it. The resultant force will decide its movement. There are major forces acting on a drone

**Weight**

Due to the mass of the drone, the body mass force always acts in the direction of gravity Higher the weight of the drone, more power is required to lift and move the drone Weight of drone = mass of drone × acceleration due to

gravity Lift The vertical force acting on the drone is called lift This force is due to pressure differences across the drone (in the vertical direction). Hence, the speed, size, and shape of the propeller blade decide the amount of lift force Lift is essential to lift the body against the gravity To create this force, all four propellors run at high speed to lift the drone

**Thrust**

The force acting on the drone in the direction of motion is called thrust. However, for drone dynamics, it is normal to the rotor plane. During hovering, the thrust is purely vertical. If thrust is inclined then the drone will tilt forward or backward. This force is essential to move the drone in the desired direction at equal speed To get desired motion, two propellors have been given high speed

**Drag**

The force acting on the drone in the opposite direction of motion due to air resistance is called drag This may be because of pressure difference and viscosity of air To reduce the drag, the aerodynamic shape of the drone is selected Kinematic for Quad-copter The thrust produced by each propeller is perpendicular to the plane of rotation of propellors.

**Limitation**

- In this research we will design the mechanical structure of an unmanned aerial vehicle of the Quadcopter type.
- A facial recognition system is designed.
- Brushless motors without brush will be used.
- An ESC (Electronic Speed Controller) is purchased.
- The PIXHAWK flight controller board is purchased
- We do not intend to make flights of great height, we limit ourselves to make flights as allowed by the norm of the Indian government that mentions: "No person will be able to operate a UAV around 9 km of an airport or military base".

## CONCLUSION

In conclusion, this proposed method aims to develop a facial recognition system with low cost and good performance implemented in UAV to able to recognize criminals. The advantage of this proposed method is based in the use of drone with artificial intelligence. In future works this weakness will be solved, using the drone from extremely high heights and with 30 minutes of flight time, besides we are testing another CNN's models such as VGG Face and AlexNet to obtain 98.5% accuracy. Due to that we will use diferents electronics devices aqua copter from scracth is build, thus, we are designing the final model by Solid works. Finally we will use robotic operative system to have a embedded system.

## ACKNOWLEDGEMENT

It brings to a great pleasure in submitting with this paper with deep sense of attitude and profound respect towards a project guide Professor **C.SURESH**,**M.E**, for his valuable guidance, timely support and inspiration in the completion of this dissertation entitled "USING DRONE TO RECOGNISE FACE DETECTION AND MOVEMENTS". I am also grateful to our respective HOD **Dr. K. ARUTSELVEN** for giving the instructions which are always constructive.

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