Social Distancing & Anti-Riot Drone with Tear Gas

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Abstract: To ensure masks compulsion and social distancing, constant policing and monitoring is necessary and constant reminders to offenders. To ease this task, we here design a drone that can patrol long distances easily and ensure social distancing as well as mask are worn in public places. In riot people violently throw stones and set buses on fire. To control such situations police and armed force is appointed. They have used lathis or batons, water cannons and teargas to disperse an unlawful assembly. Tear gas is sometimes difficult for policemen to execute, it can't be thrown from long distance or it becomes difficult to go between the aggressive crowd throwing stones, to overcome such problem this Anti- Riot Drone will help armed forces to control riot crowd. Our project consists of a receiver and a RC transmitter remote. To overcome these two problems our specially designed multi-purpose drone makes use of a controller- based circuit system coupled with 4X High RPM quad copter motors for easy navigation and control .An FP camera with transmitter to transmit live footage and the loudspeaker and voice receiver to scold/warn offenders remotely via the drone as soon as they are spotted. When the drone approaches the crowd the security person controlling the drone will press a button on the remote which will cause the smoke canister to drop. Thus, activating the tear gas canister when it impacts the ground which will be dropped on to the crowd using a servo mechanism.

Keyword: Armed Forces, Riot Crowd, Smoke Canister, Tear Gas, Wear Mask.

I.INTRODUCTION

Social distancing place a major role in pandemic situation also some cases where crowd pulling is not required like by the time of strikes and emergency situations. Some times in such cases the riot people violently throw stones and set buses on fire. To control such situations police and armed force is appointed. They have used sticks or batons, water cannons and teargas to disperse an unlawful assembly. Tear gas is sometimes difficult for policemen to execute, it can't be thrown from long distance or it becomes difficult to go between the aggressive crowd throwing stones, to overcome such problem this Anti- Riot Drone will help armed forces to control riot crowd.

For this work our project consists of a receiver and a RC transmitter remote. The drone is controlled by the RC remote, this transmitter sends wireless commands to the receiver, by pressing another button of the remote and the receiver will start the camera and stream the live video on the screen wirelessly. One joystick on the remote controls the direction of the drone (forward, backward, left & right). The other joystick is used for altitude control, it controls how high the drone flies. Using a button, the remote we control the dropping of the tear canister. In this system, the drone will have an assembly to carry the tear gas canister. When the drone approaches the crowd the security person controlling the drone will press a button on the remote which will cause the smoke canister to ignite.Thus, activating the tear gas canister which will be dropped on to the crowd using a servo mechanism. Drones for military use were started in the mid-1990s with the High-Altitude Endurance Unmanned Aerial Vehicle Advanced Concept Technology Demonstrator (HAE UAV ACTD) program managed by the Defense Advanced Research Projects Agency (DARPA) and Defense Airborne Reconnaissance Office (DARO). This ACTD placed the base for the improvement of the Global Hawk. The Global Hawk hovers at heights up to 65,000 feet and flying duration is up to 35 hours at speeds approaching 340 knots and it costs approximately 200 million dollars. The wingspan is 116 feet and it can fly 13.8094 miles which is significant distance.

The reliance and use of drones is constantly rising in numerous domains. This is due to the drones' ability to offer a live-stream, real-time video and image capture, along with the ability to fly and transport

goods. As a result, more than 10,000 drones will be operational for commercial use within the next five years. This is mainly due to their advantages over commercial helicopters when it comes to costs and budget. Moreover, the technological advancement enables easy manipulations via smart-phones to fly mini-drones instead of using remote controllers. In fact, the use of drones is not limited to commercial and personal aims. Drones being used by law enforcement and border control surveillance teams in case of natural disasters, search and rescue operations.

II.LITERATURE SURVEY

Recently, the world witnessed a significant increase in the number of used drones, with a global and continuous rise in the demand for their multi-purpose applications. The pervasive aspect of these drones is due to their ability to answer people's needs. Drones are providing users with a bird's eye that can be activated and used almost anywhere and at any time. However, recently, the malicious use of drones began to emerge among criminals and cybercriminals alike. The probability and frequency of these attacks are both high and their impact can be very dangerous with devastating effects. Therefore, the need for detective, protective and preventive counter-measures is highly required. The aim of this survey is to investigate the emerging threats of using drones in cyber-attacks, along the countermeasures to thwart these attacks. The different uses of drones for malicious purposes are also reviewed, along the possible detection methods. As such, this paper analyzes the exploitation of drones vulnerabilities within communication links, as well as smart devices and hardware, including smart-phones and tablets. Moreover, this paper presents a detailed review on the drone/Unmanned Aerial Vehicle (UAV) usage in multiple domains (i.e civilian, military, terrorism, etc.) and for different purposes. A realistic attack scenario is also presented, which details how the authors performed a simulated attack on a given drone following the hacking cycle. This review would greatly help ethical hackers to understand the existing vulnerabilities of UAVs in both military and civilian domains. Moreover, it allows them to adopt and come up with new techniques and technologies for enhanced UAV attack detection and protection. As a result, various civilian and military anti-drones/UAVs (detective and preventive) countermeasures will be reviewed [1].

Debates about terrorism and technology often focus on the potential uses of technology by non-state terrorist actors and by states as forms of counter terrorism. Yet, little has been written about how technology shapes how we think about terrorism. In this Chapter I argue that technology, and the language we use to talk about technology, constrains and shapes our moral understanding of the nature, scope, and impact of terrorism, particularly in relation to state terrorism. After exploring the ways in which technology shapes moral thinking, I use two case studies to demonstrate how technology simultaneously hides and enables terrorist forms of state violence: police control technologies and Unmanned Aerial Vehicles (UAVs), or drones. In both these cases.[2].

The most crucial factor is the reduced cost of operation and easy management. You don't need a truck or delivery van and can save the fuel costs. Also, there is no need to pay the driver as drones can be automated to avoid obstacles and fly on their own.Lockdown is not a permanent solution to deal with COVID-19. Lockdown has affected the economy, daily routine as well as the mental health of the people. After a certain stage, the government has to provide some relief in the lockdown. It will be a very cumbersome task to lift the lockdown at the end when all persons infected with COVID-19 get cured. Though such a scenario will be better, it is not feasible. So ultimately to adopt the regular practice of maintaining the distance of 1.5 m and hand sanitization is the better preventive against COVID19 [3].

III.PROPOSED METHODOLOGY

To overcome these two problems we specially designed multi-purpose drone makes use of a controller- based circuit system coupled with 4x High RPM quad copter motors for easy navigation and control. An FP camera with transmitter to transmit live footage. A loudspeaker and voice receiver to scold/warn offenders remotely via the drone as soon as they are spotted. When the drone approaches the crowd the security person controlling the drone will press a button on the remote which will cause the smoke canister to drop. Thus, activating the tear gas canister when it impacts the ground which will be dropped on to the crowd using a servo mechanism.To

overcome these problems Our specially designed multi-purpose drone makes use of a controller- based circuit system coupled with 4x High RPM(Revolutions Per Minute) quad copter motors for easy navigation and control.

An FP camera with transmitter to transmit live footage. A loudspeaker and voice receiver to scold/warn offenders remotely via the drone as soon as they are spotted at the places. When the drone approaches the crowd the host who is controlling the drone will press a button on the remote which will cause the smoke canister to drop some tear gas. Thus, activating the tear gas canister then it impacts on the ground which will be dropped on the crowd using a servo mechanism. And also for live location tracking a GPS(Global Positioning System) module is used to navigate and hover in the place.

System Architecture

The design of our proposed system, as well as the devices used in this model, is described in this section. Flight controller is the brain of the drone. which controls the motors and ESCs in the drone and in built it has Sensors, processors Communication protocols, and transmitter pins are installed and a flight controller controls every aspect of the drone. it moves the drone by changing the motor's RPM May 1 Revolution per minute and esc (electronic speed controllers) and regulator is connected to this flight controller regulator because it ensures a steady constant voltage Supply through all operational conditions it regulates Voltage during paver fluctuations and Variations. and Battery and power distribution board is connected to 30 amphere. The use of ESCs is to control the speed of BDLC motor. This 30A ESCs can be power with Lipo batteries and power distribution board and the receiver receives commands from a radio transmitter by interpreting the signal through the fight controller where these commands are translated in to specific actions to control the drone like buzzer and speaker, and Camera and Servo arm Here Speakers and butters are used to Command the people- and by the Servo arm we Spray the tear gas.

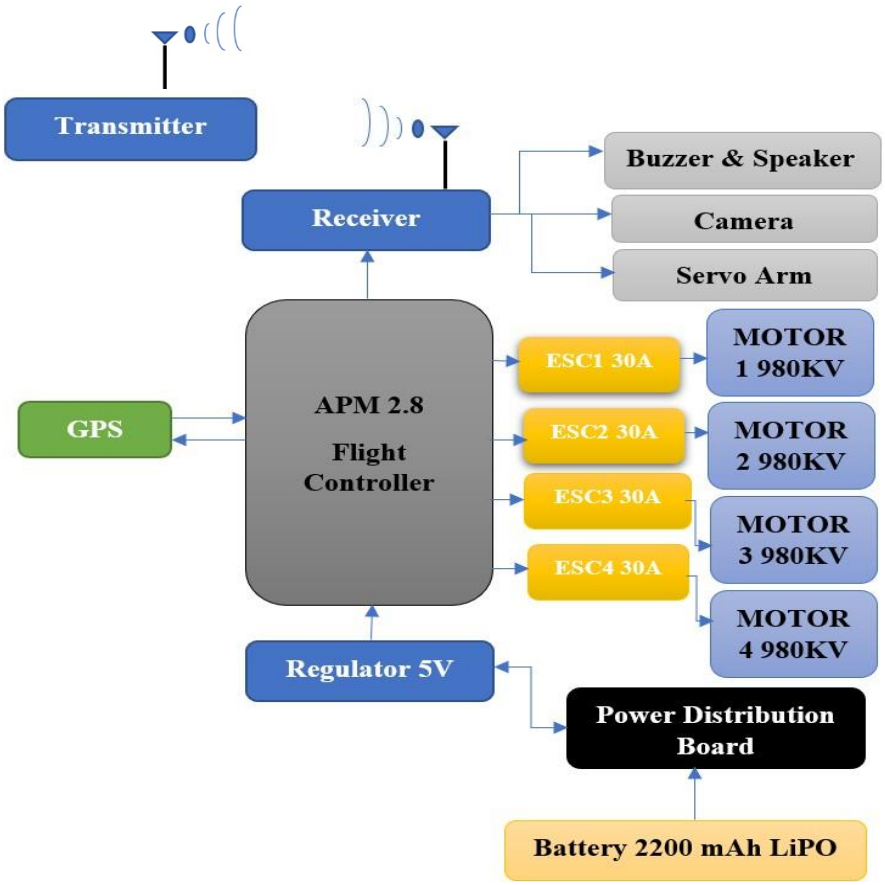


Fig1: Block diagram of System Architecture

a)TRANSMITTER AND RECIEVER (FLY SKY 6T 6B):

The Transmitter is an electronic device that uses radio signals to transmit commands wirelessly via a set radio frequency over to the Radio Receiver, which is connected to an aircraft or multi rotor being remotely controlled.

Fig2: Transmitter and Reciever (fly sky 6t 6b)

b) ESP32-CAM

Fig3: ESP32-CAM

The ESP32-CAM is a full-featured microcontroller that also has an integrated video camera and micro SD card socket. It's inexpensive and easy to use, and is perfect for IoT devices requiring a camera with advanced functions like image tracking and recognition. The ESP32-CAM module has fewer I/O pins than the previous ESP-32 module we looked at. Many of the GPIO pins are used internally for the camera and the microSD card port. Another thing missing from the ESP32-CAM module is a USB port. In order to program this device you'll need to make use of an FTDI adapter here is the pin out of the ESP32-CAMModule:

Fig4:ESP32-CAMModule:

III.IMPLEMENTATION AND WORKING

The main aim of this project is to provide good safety and quick response for those who are in danger. To do this, Python programming is used. When we started our design and plan for the project, we faced some challenges that are lack of the parts and hard to have them in short period for our project such as special type of motors and control system to assist the lifting of the design. Moreover, most of parts have been bought from out of kingdom due to they are not available in local market, Furthermore, the different companies that refuse to work in making the design , because they do not have official authority to make it. Finally, one company accept to do the design in shape only without making any programming for the control system and we informed them, that design was requested from PMU for the student of senior graduation project and all experiments will be done inside the campus of the university for developing the movement of drone. However, we should take considerations on the weight of design and focused on the thrust strength of the motor to rise the design without cause any over load so, we can fly it in easily method.

i. Sustainability.

We may face a problem in terms of sustainability due to chance of little vibration Because the thickness & angle of the blades of the fan and to avoid this problem, we used smaller fan with high efficiency to be suitable with the motor movement in the thrust.

ii. Safety.

One of the important of our system is safety of parts. Keeping the motor running not over loaded, this will increase the efficiency of the quadrate rising and keep the movement of the fan stable.

iii. Ethical.

This project almost looks like the previous kind of works. So, we searched to get some general ideas to improve the design by our own ideas in terms of safety, economically, and sustainability

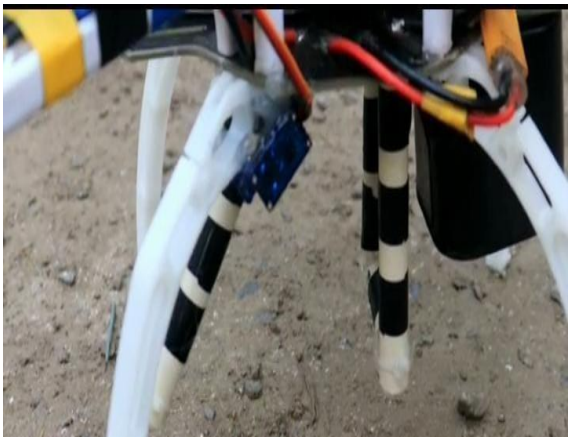
IV.RESULTS

a. Computer transmitter.

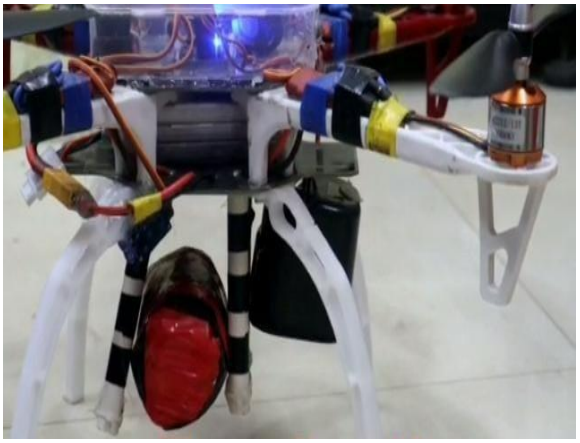
b. Rotation of Propellers.

c. Drone Movements.

d. Drone Movements.



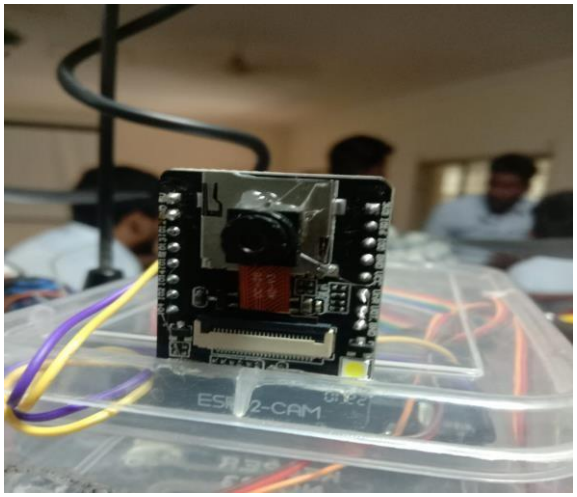
e. Tear Gas Holder.



f. Holding tear gas.

g. Spraying Tear Gas From Drone.

h. After Spraying Tear Gas in Crowd.



i. Drone Camera

j. Overall Structure of Drone

V. CONCLUSION AND FUTURE SCOPE

In the paper, we discussed about the implementation the "SOCIAL DISTANCING & ANTIROIT DRONE WITH TEAR GAS" has been successfully designed and tested. In this system, the drone will have an assembly to carry the tear gas canister. When the drone approaches the crowd the security person controlling the drone will press a button on the remote which will cause the smoke canister to ignite. Thus, activating the tear gas canister which will be dropped on to the crowd using a servo mechanism. Social distance emerged as one of the most disruptive features of the COVID-19 pandemic, and, with it, myriad problems were created. Aiming at filling some the gaps generated by physical separation, drones promised solutions and fixes to some of those problems. The overview provided in this article suggests that we are witnessing a functional expansion in the use of drones, and this usage may impact society in several analytically relevant ways in the long run.

The future scope here is we can upgrade to fully automatic face mask detection and crowd detection using deep learning. By using drone camera at low temperatures or high temperatures or high pressures, humans cannot go to that places with the help of the drone. We can check the machines whether it is properly working or not and this is mainly used in industries. By using Radar and thermal scanning we can detect the objects behind the walls and we can upgrade it,

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