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Covid 19 Drone (Face detection ,social distancing and bio sensor)

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Abstract: In recent years several research have improved the means by which human to machine interaction is possible; one of such machines is DRONE. A drone is an unmanned aircraft. It is a flying ROBOT. Drones can be remotely controlled. Also, sensors and GPS can be attached to them. A drone has large potential for performing task that are very dangerous for humans.

A quadcopter is also called as quadrotor helicopter or quadrotor. It is a drone that is lifted and propelled by four rotors. By changing the speed of each rotor, it is possible to specifically generate a desired total thrust; to locate for the center of thrust both laterally and longitudinally; and to create a desired total torque or turning force. A quadcopter is lifted and propelled by four rotors. All 4 arms of quadcopter have a motor and a propeller at each of their ends.

This project was taken with an idea of the current pandemic situation we all are fighting. Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. It is similar to influenza viruses and raises concerns through alarming levels of spread and severity resulting in an ongoing pandemic worldwide. Within eight months (by August 2020), it infected 24.0 million persons worldwide and over 824 thousand have died. Drones or unmanned Aerial Vehicles (UAVs) are very helpful in handling the COVID-19 pandemic. The drone will move aerially for almost 30 mins and will simultaneously collect the data. If the person is not wearing a mask or person is not maintaining the social distancing that it will raise an alarm informing that they need to follow some social distancing or wear a mask so that we can fight this situation. The success of this project ensures that some of our heroes(policeman) now do not need to risk their life. Further, open challenges are identified, and promising research directions are highlighted. The rapid community-spread of novel human coronavirus 2019 (nCOVID19 or SARS-Cov2) and morbidity statistics has put forth an unprecedented urge for rapid diagnostics for quick and sensitive detection followed by contact tracing and containment strategies, especially when no vaccine or therapeutics are known. Currently, quantitative real-time polymerase chain reaction (qRT-PCR) is being used widely to detect COVID-19 from various types of biological specimens, which is time-consuming, labor-intensive and may not be rapidly deployable in remote or resource-limited settings. This might lead to hindrance in acquiring realistic data of infectivity and community spread of SARS-CoV-2 in the population. This review summarizes the existing status of current diagnostic methods, their possible limitations, and the advantages of biosensor- based diagnostics over the conventional ones for the detection of SARS-Cov-2. Novel biosensors used to detect RNA-viruses include CRISPR-Cas9 based paper strip, nucleic-acid based, aptamer-based, antigen-Au/Ag nanoparticles-based electro- chemical biosensor, optical biosensor, and Surface Plasmon Resonance. These could be effective tools for rapid, authentic, portable, and more promising diagnosis in the current pandemic that has affected the world economies and humanity. Present challenges and future perspectives of developing robust biosensors devices for rapid, scalable, and sensitive detection and management of COVID-19 are presented in light of the test-test-test theme of the World Health Organization (WHO).

IndexTerms **- Biosensors · SARS-CoV-2 · COVID-19 · Rapid detection**

I. INTRODUCTION

II. Quadcopter is a Vehicle which have large potential for performing task that are dangerous for humans. Examples are the inspection of high structures, humanitarian purpose or search-and-rescue missions. A Quadcopter or a quadrotor helicopter is a multirotor copter that is lifted and propelled by four rotors. All the four arms have a motor and the propellers at eachof their ends .The lift is generated by a set of rotors and vertically oriented propellers; hencequadcopters are classified to rotorcrafts.

III. A Quadcopter uses 2 sets of identical fixed pitched propellers: 2 motors rotate in clockwise direction and the other 2 motors rotate in anticlockwise direction .This helps the machine to hover in a stable formation. This is unlike most helicopters. Control of vehicle motion is achieved by altering the rotation rate of one or more rotor discs, there by changing its torqueload and thrust/lift characteristics. This use variations of RPM unit(Revolutions per minute) to control lift and torque.

IV. The multirotor with a high number of blades are designed to carry a heavier payload, for efficient yaw smoothness and for efficient lift capacity. According to the efficiency needed for a particular task, respective series may be used. But a quadrotor's all four rotors work together to produce upward thrust and only ¼ of the weight is lifted by each rotor, so less powerful motors are used making it cost efficient. The quadrotor's movements are controlledby varying the relative thrusts of each rotor. The quadcopter allows a more stable platform, making it ideal for task such as surveillance and aerial photography, attributing to its uniquedesign.

2.AIM

In our project we have implemented quadcopter to reduce the spread of the virus, we are detecting if the person is wearing a mask or not and if the drones found out that person is notwearing a mask or he/she is wearing a mask not properly, then it will raise an alarm to informthem to wear the mask properly. Similarly, we have also incorporated with the social distancing parameter that if the group gathering is done than they should maintain social distancing if not then our drone will detect that there is not a proper social distancing maintained and again raise an alarm to inform them that they should maintain the social distancing.

2.1 OBJECTIVE

The application will work as follows:

a. Make the drone fly and by using open cv python we will detect the face mask detectionand social distancing.
b. Raise an alarm if we found that the above parameters are not followed.

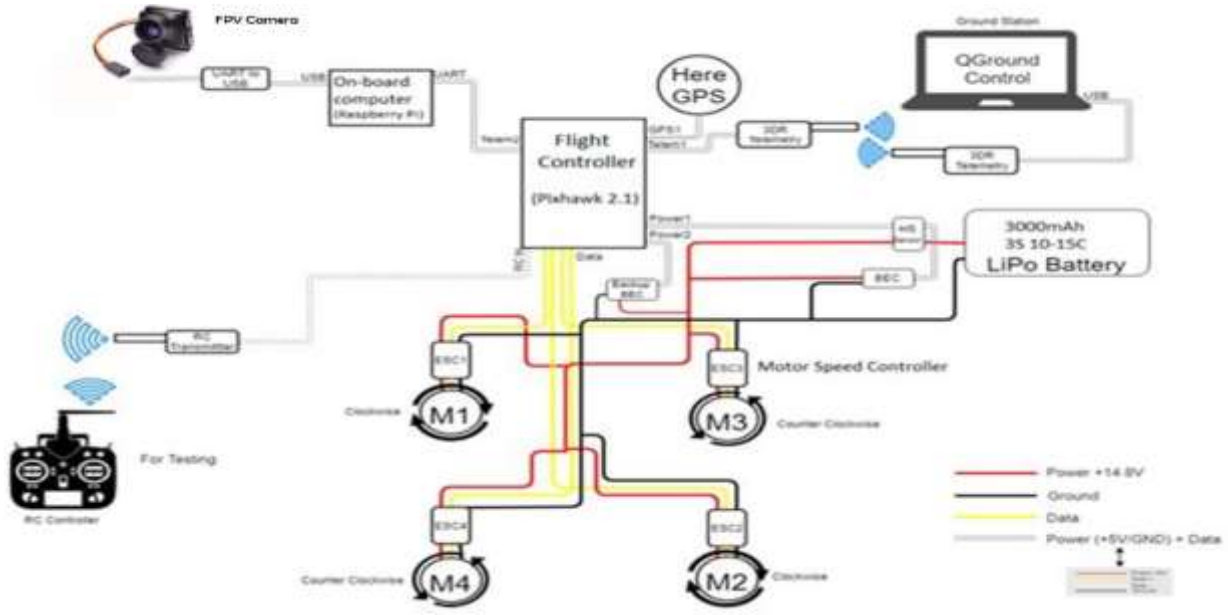
2.2 Motivation

India being such a strong country throughout the years and now one virus is making our country weaker and weaker, our real live heroes are losing lives to fight these viruses, andbeing a citizen of India it's our moral responsibility to support our country as much we can. So, our country is our biggest motivation.

2.3 SCOPE

When it comes to project planning, defining the project scope is the most critical step. Incase if you start the project without knowing what you are supposed to be delivering at the end to the client and what the boundaries of the project are, there is a little chance foryou to success. In most of the instances, you actually do not have any chance to success with this unorganized approach. The main purpose of the scope definition is to clearly describe the boundaries of your proje

Block Diagram



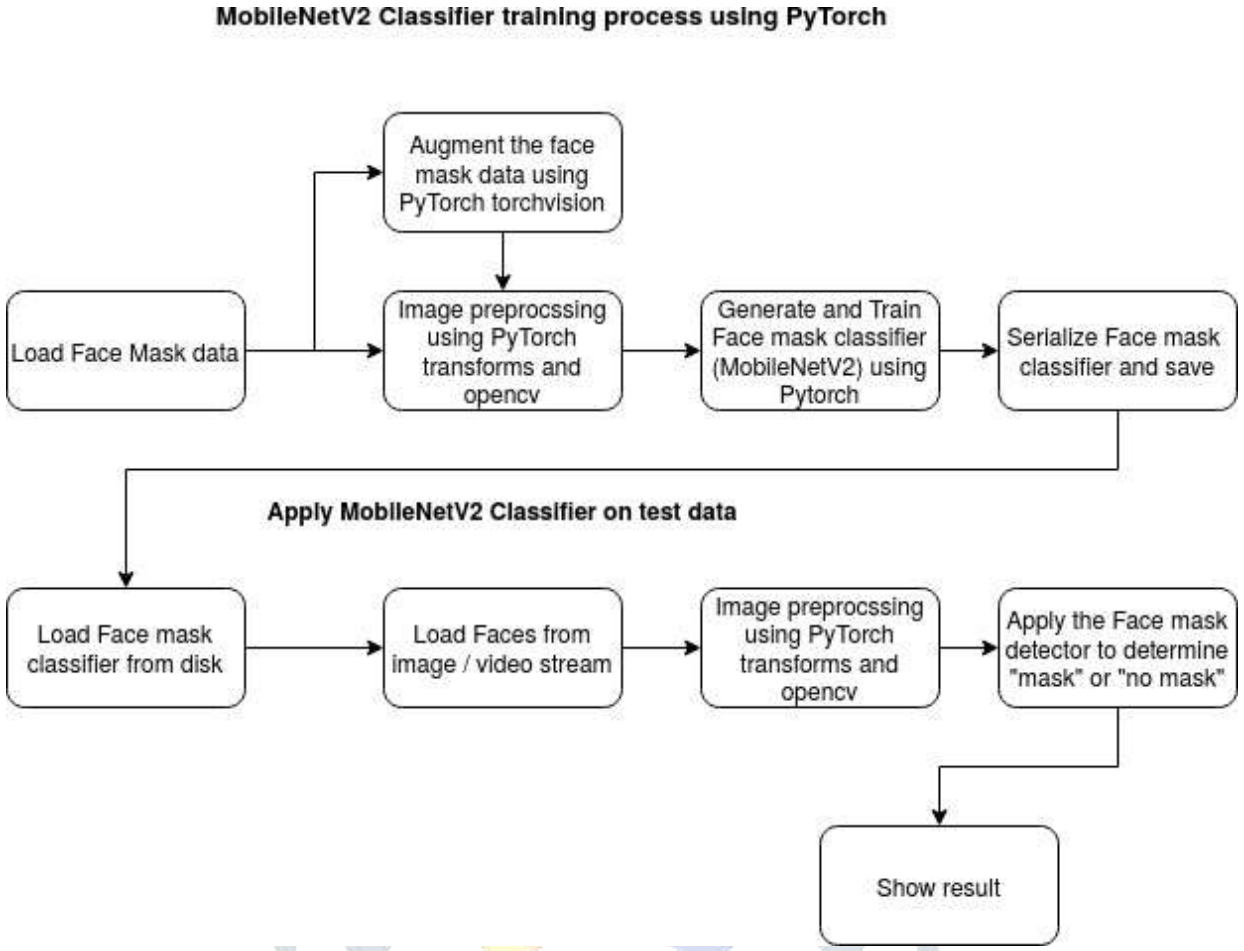
Calculation

Table1 below shows the most components which are used in the design of the prototype of this study with its weight. The weight is too important in the next sections as it is needed to calculatethe thrust, power, and flight time

Parameter	specifications
Frame	330 grams
Motors X4	212 grams
Flight controller	40 grams
Electronic Speed Controller ESC X4	128 grams
Ublox GPS Neo-M8N module	15 grams
LiPo battery Blackmagic 5200 mAh	400 grams
Raspberry PI3 B+ and other connectors and cables	265 grams
Total weight	**1390**

TABLE 5.2.1 . QUADCOPTER COMPONENTS WEIGHT.

Face Mask Detection Flow Chart



9..RESULTS

Final Network Model Architecture / Flow

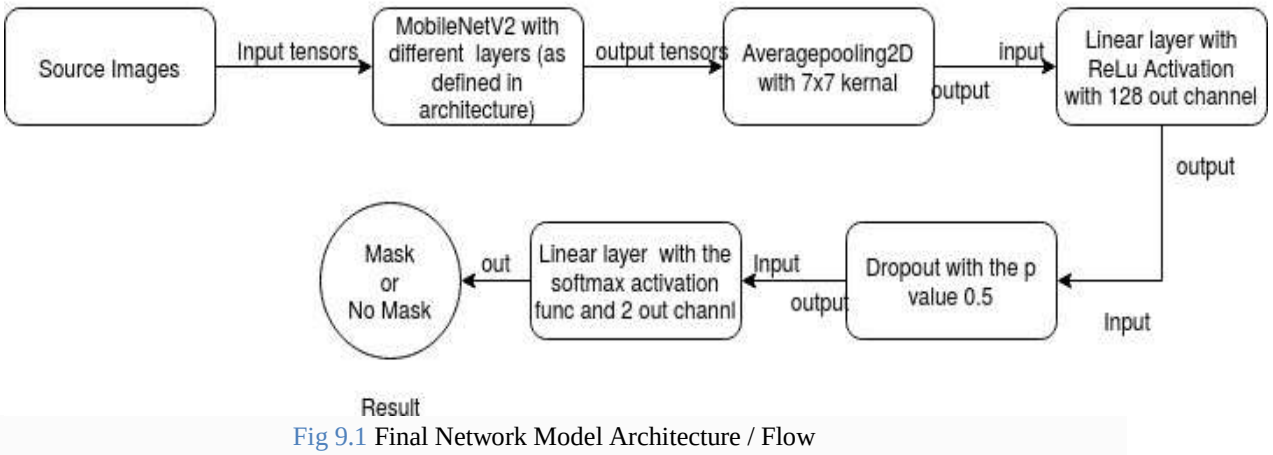


Fig 9.1 Final Network Model Architecture / Flow

The data set has been divided into two sets, likely a training and validation set. The accuracyof image classifier over the training set vs validation.

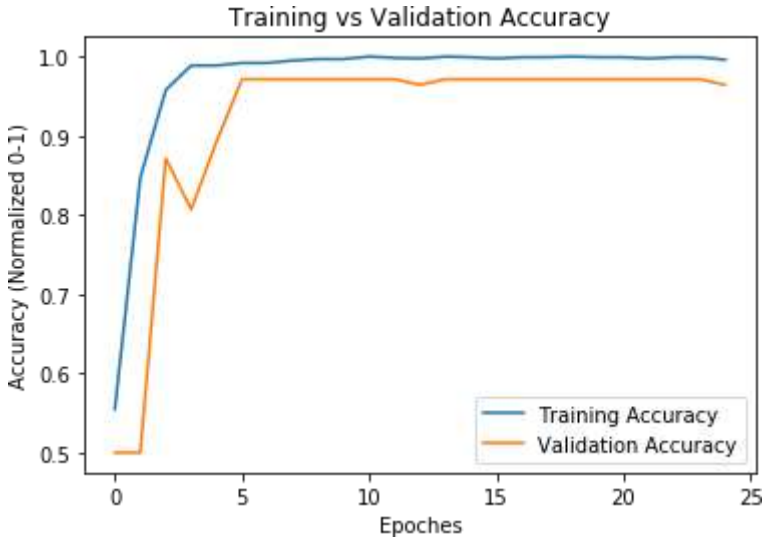


Fig 9.2 Training vs Validation Accuracy

.CONCLUSION

Thorough problem and context understanding, coupled with the right drone solution could really offer a breakthrough for the use of this technology, however, it also needs to be supported by appropriate regulatory framework, local skills and sustainability plan. Seeing the full picture is essential to enable supply chain managers make cost-efficient and impactfuldecisions as part of their COVID-19 response.

The instances of drone use in transportation of lab samples or medical supplies still need time to demonstrate impact or transformational value, however number of countries managedto deploy drones quickly due to the regulation and other foundations which served as enabling factors. For drones to be considered a viable solution to COVID-19 pandemic, thespecific problem must be clearly defined, and a context analysis for using drones must be prioritized that would ultimately help design better drone solutions and use cases, demonstrating an actual impact on health (and related) outcomes. A proper understanding ofthe design of the existing health supply chain system must be done to inform the most potentuse cases, locations, routes, commodities and transportation modalities, and will provide a strategy for (cost-)effective and efficient supply chain's optimization by drones.

The effective use of technology cannot be scaled without building an appropriate support system and enabling environment. In order to operationalize the use of drones for pandemicsor, in general, health supply chain work, enabling environment becomes crucial. Finally, technology sourcing and service provider selection needs to be guided through a rigorous, well defined procurement process and quality assurance. Building a support system and an enabling environment requires focus on a few different, but essential aspects:Rapid Guidance UNICEF Supply Division: Strengthening Public Supply Chains to drive change for childrenevery day, across the globe

How Drones Can Be Used to combat COVID-19

1. Appropriate financial and human resources need to be in place in order to have drone technology that is available when needed - either through service contracts, or by having local organizational capacity to run drone operations. It also needs to take international movement, health and supply restrictions into consideration.

2. Establishing procurement algorithms that are built on selecting most cost-efficient servicethat offers quality (service and technology), agility, sustainability, compliance and other keyelements.

3. Drone program implementation cannot be done without local skills and capacity therefore, local education and knowledge transfer is the key enabler. This does not only apply to peoplewho can run drone operations, but also to

governmental entities and health sector that are theultimate end-users of this technology.

Drone utilization is not possible unless there is a local regulation enabling safe drone operations.

4. Local sensitization of communities and stakeholders needs to be done before and duringthe drone program implementation, in order to inform the public and raise awareness about the technology, ultimately ensuring local social and political acceptance.

5. Drone integration into the health supply chain has to be shaped and determined by the design of the existing health supply chain system, taking into consideration the problem thatdrones are solving, the purpose of the use of this technology, as well as clarifying whether drones is the cost-effective alternative to existing transport modalities

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