

THE TRAILBLAZERS

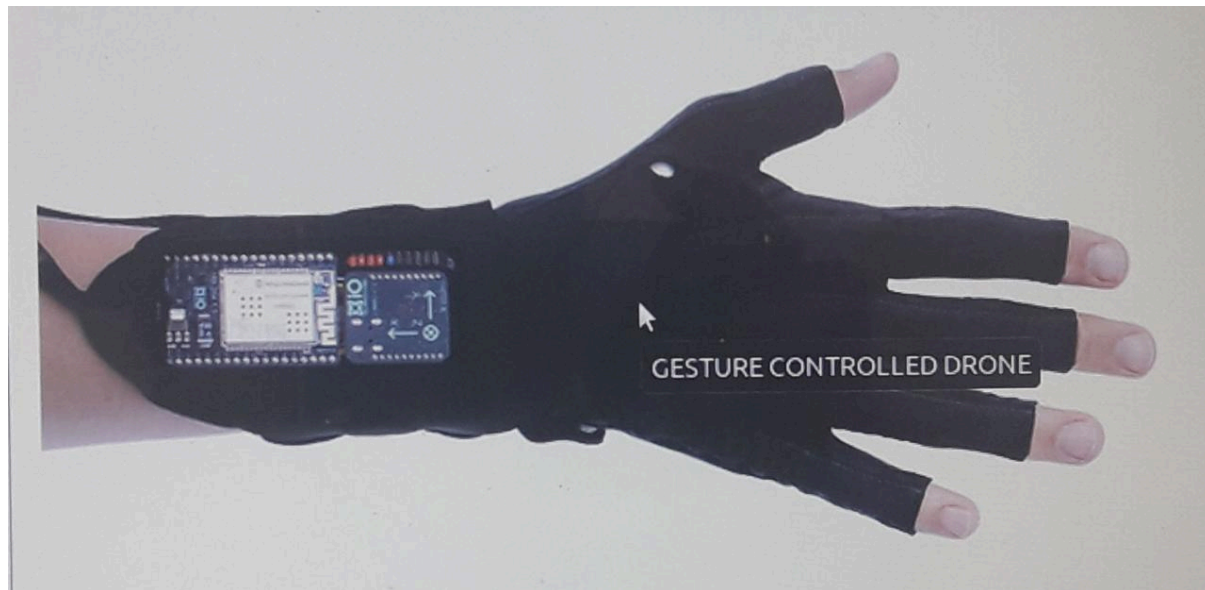
Keywords - drone,arduino,motion sensor

TEAM MEMBERS-

1. KARAN AGARWALLA - 180050045
2. IMMANUEL WILLIAMS - 18D070049
3. DIBYOJEET BAGCHI - 18D070045
4. PRASHANT SHETTIGAR - 18D070063

PROBLEM STATEMENT

Devices like drones are widely controlled using remote or mobile phones but what if we could control them using gestures! Isn't it be cool and much easy to fly a drone by moving just your hands. It would be much easier to control a gesture based drone compared to a remote control based device.



MOTIVATION

It was our childhood dream to make something cool and what else can be better than making your own drone. Just like Rancho made one in 3 Idiots. It always inspired us to make a drone of our own too. And recently we saw a very cool gesture control drone video on YouTube. This made us crazy and we have decided to dedicate this summer to make something memorable like making a gesture control drone.

<https://youtu.be/tnC1NH1Ozu0>

<https://www.youtube.com/watch?v=YrtANPtntyg&feature=youtu.be>

These are some videos that have motivated us.

PROJECT DESCRIPTION

GESTURE CONTROLLED MULTI PURPOSE DRONE

DRONE WITH GESTURE INTEGRATION

Drones nowadays are widely used around the world for a variety of purposes including aerial videography, photography, surveillance etc. In many cases, there is a requirement of a skilled pilot to perform these tasks using the drone which proves to be exorbitant. A simple gesture controller can make the task of piloting much easier.

Gesture recognition technology helps you to communicate or control any other devices via your hand gestures. From this technology, you can control the drone simply by moving your hands.

Now you can control your drone by doing the gesture where you don't need to have the transmitter in your hand for a flying drone. An gyro-accelerometer will be fixed over on the hand that will detect the movement of the body, then it sends the signal to the microcontroller. That signal will be sent to the drone with the help of transmitter.

LINKS

1. <http://www.ecs.umass.edu/ece/sdp/sdp17/team20/MDR%20Report.pdf>
2. <https://www.engadget.com/2018/10/27/flycrotugs-gripping-lifting-drones-stanford-epfl/>

EQUIPMENT REQUIRED

1. **FRAME**
2. **MICROCONTROLLER:**Arduino board
3. **SENSORS**
4. **BLUETOOTH MODULE**
5. **POWER MODULE:** Power module is used to power the flight controller.Nothing but the voltage regulator
6. **ESC:** Electronic Speed Controller used for controlling the speed of the BLDC motor
7. **MOTOR:** BLDC motor.
8. **PROPELLOR:** Its a device a which converts the rotational motion into the thrust
9. **BATTERY:** You can use lipo battery as a power source
10. **TRANSMITTER AND RECEIVER:** It should have a minimum of 5 channel

ESTIMATED BUDGET

EQUIPMENT	COST (IN RUPEES)
DRONE FRAME	1000-1500
POWER DISTRIBUTION BOARD	300-400
LIPO BATTERY	1800
BLDC MOTOR x4	1600
ELECTRONIC SPEED CONTROLLER x4	400
VOLTAGE REGULATOR(LM7805)	100
TX and RX MODULE(NRF24L01)	300-400
BLUETOOTH MODULE	300-400
GYRO ACCELEROMETER(MPU6050) x2	500
UNO R3 ARDUINO x2	800
PROPELLER x4	400
TOTAL COST	7500-8300

Prices are taken from Amazon.in

1. FRAME

https://www.amazon.in/Robodo-Electronics-Quadcopter-Integrated-Version/dp/B00MYC7NDE/ref=sr_1_22?adgrpid=60007099158&hvadid=294143749625&hvdev=c&hvlocphy=9062235&hvnetw=g&hvpos=1t1&hvqmt=e&hvrnd=15701194163002673108&hvtargid=aud-669652732042%3Akwd-298985257654&keywords=drone+chassis&qid=1553976654&s=gateway&sr=8-22

Technologies for GESTURE CONTROLLED DRONE:

- **AERODYNAMICS**
- **RADIO CONTROL**
- **AUTOPILOT**
- **GESTURE CONTROL**

Progress between Phase 1 and Phase 2 (InSem-Phase)

In the in-sem phase we have tried to concentrate mostly on learning the basic skills for the project like learning to code in C++ for **arduino** which is required in coding the drone. This phase, we will also get a rough idea of the cost required for the project. We read the reports on this type of project and saw some video.

Link- <https://youtu.be/kRxLP5BdPQI>

<https://youtu.be/dXOxavyZ5C8>

Also we came up with a basic block diagram for transmitter part and drone. Transmitter circuit includes gyro-accelerometer which feeds its output to the arduino which transmits it to the drone via transmitter. The receiver receives it and sends it to the arduino in the drone which varies the speed of individual motors with the help of ESCs connected to each motor. The drone is stabilized with the help of gyro-accelerometer via PID controller. More detailed description is given in the below links.

We will start the basic work like for hardware part, we will buy necessary items, start making the plan of execution and finally, we will jump start at the beginning of our summer vacation for accomplishing our goal.

Some Important Links:

1. <https://howtomechatronics.com/tutorials/arduino/arduino-wireless-communication-nrf24l01-tutorial/>
2. <http://mydronelab.com/blog/arduino-quadcopter.html>
3. <http://mydronelab.com/blog/how-to-build-a-drone.html>
4. <https://create.arduino.cc/projecthub/robocircuits/arduino-quadcopter-860741>
5. <https://www.dronezon.com/learn-about-drones-quadcopters/drone-components-parts-overview-with-tips/>
6. http://www.electrionoobs.com/eng_robotica_tut6.php

Time Plan during Summer phase

1st week

1. Opening the drone and transmitter systems and assembling the various parts.
2. Fixing all the parts in the frame properly
3. Connecting the motors to supply to ensure they are working well
4. Starting the work on drone stabilization code (stabilization done via gyro accelerometer sensor with the help of arduino)

2nd week

1. Building the drone circuit by integrating various components (gyro sensor, arduino uno, receiver module, ESCs, etc)
2. Finishing up with tentative code and starting with its testing

3rd week

1. Debugging the drone stabilization code.
2. Starting with Gesture Control part of the project (circuitry and code)

4th week

1. Finishing the drone stabilization part.
2. Thinking on the code of the gesture control glove and its integration with the drone circuit (via NRF24L01)

5th week

1. Testing and debugging of the gesture control code
2. Wrapping up with construction of the drone

6th week

1. Infi flying.....