ABSTRACT

Team Details:

Team name: Velocity Vortex

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1.Nature of Your Multirotor : Quadcopter

2.Weight of your Multirotor: 525g

Specifications of your Multirotor:

Write a brief description of all the components you have used.

S.NO	Component	Rating
1	BLDC	RS -2205, 2300KV

2	ESC	Cyclone 35A 2-6S Blheli_S DSHOT600 OPTO
3	Li-Po	3s - 11.1V, 1000Mah
4	Flight controller board	Kk 2.1.5 Flight Controller
5	Propeller	Orange HD 5152 (5.1in x 5.2in) Tri Blade Flash Propellers

Design and features of the copter:

Frame :- The Lumenier QAV-R racing drone boasts a lightweight 3K carbon fiber airframe, 4mm removable arms, custom aluminum hardware for quick arm swapping, and neoprene landing pads for crash-proof landings.

Motor:- The RS2205 2300KV BLDC Motor is the perfect option for novice FPV racing, offering affordable high-quality performance with unique cooling fins and N52 Neodymium magnets for efficient and smooth operation.

Flight Controller:- The KK2.1.5 flight controller features an 8-bit AVR RISC microcontroller with 64k of memory, an inbuilt accelerometer and gyroscope, and 6050 MPU with auto level function. It has eight motor outputs and five control inputs, with an operating voltage of 1.8V to 5.5V and input voltage of 4.8-6.0V

Propellers:- The Orange HD 5152 Tri-Blade Flash Propellers are made of high-quality Polycarbonate for racing. With a length of 5.1 inches and pitch of 5.2 inches, the inverse tip design provides a smooth and responsive performance..

Battery:- The Orange 1000mAh 3S 30C/60C LiPo battery boasts high performance and reliability, with heavy-duty leads and gold-plated connectors
Remote

RC Controller:- The Flysky CT6B 2.4 GHz 6CH transmitter, with its reliable 2.4 GHz signal technology and 6-channel operation, is an ideal choice for quadcopters and multirotors.

Camera:- RunCam Nano 3: Tiny yet powerful camera for Tiny Whoop with 1/3” 800TVL sensor, 160° FOV lens, and only 1.1g ultra-lightweight.

Progress:

Week 1: Background Research and Ideation

Researched various quadcopter designs, components, and technologies.
Determined the specifications and requirements for the quadcopter, such as size, weight, flight time, and payload capacity.
Brainstormed and ideated different designs that meet the requirements.
Selected a final design and create a parts list.

Week 2: Designing

Used computer-aided design (CAD) software to design the frame and other components.
Chose motors, ESCs, batteries, and other necessary parts and integrated them into the design.
Verified that the design meets the requirements and made necessary adjustments.

Week 3: Fabrication

Acquired the necessary materials and tools.
Fabricate the frame, assembled the components, and attached the motors and propellers.
Tested the basic functionality of the quadcopter, such as motor rotation and control input.

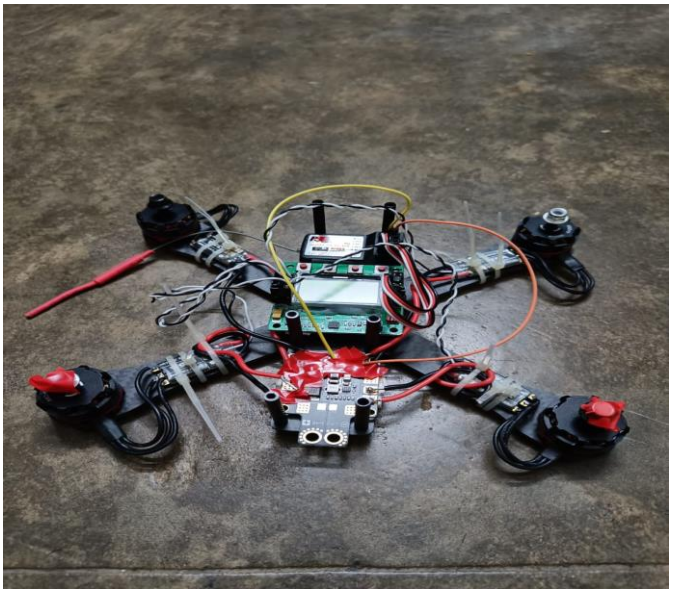
Week 4: Calibration and Testing

Calibrated the sensors and flight controller to ensure accurate readings and stable flight.
Yet to conduct initial test flights to assess the stability and manoeuvrability of the quadcopter.
We have to fine-tune the settings and control parameters to optimize performance.
Conduct more extensive testing and make any necessary adjustments before finalizing the design.

Problems faced

Calibration of the set up posed many difficulties. The objective was to control the flight controller through the receiver followed by ESC and then RC. Each and every time we power on the motor we have to calibrate all the four. We are trying to calibrate it permanently.

Fabrication Photos



[Link for 3d CAD Model]