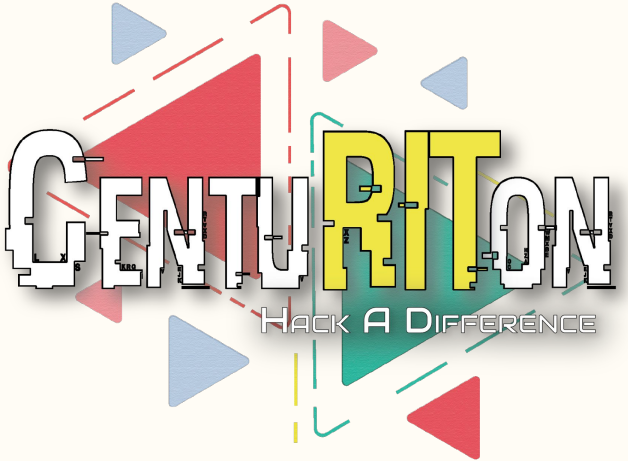
RAMAIAH Institute of Technology

GeeksforGeeks Devfolio polygon MLH MAJOR LEAGUE HACKING

IDEA SUBMISSION TEMPLATE



IDEA OVERVIEW

VTOL: A miniature UAV with versatile applications

Open Innovation

The geography of India is extremely diverse, with landscape ranging from snow-capped mountain ranges to deserts, plains, hills and plateaus.Though the state government claims to have built several roads in rural areas, the data shows that hundreds of villages do not have connectivity with major connecting roads.Due to the poor connectivity ,villages are deprived direct access to their requirements .

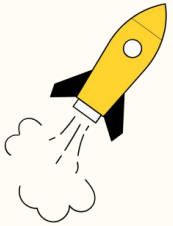
DELIVERABLES

We plan on solving this problem using VTOL (vertical take-off and landing).People living in remote areas will be delivered with the requested items quickly and efficiently using VTOL. Crucial deliveries like medication and blood bags can be delivered to the required area very swiftly and safely using this VTOL.

VTOL is being chosen as our mode of delivery because it is faster than a drone or quadcopter, uses less energy and can be mass produced for large scale applications. But the main feature of a VTOL is in its name that is, Vertical TakeOff and Landing , meaning , it does not require long air strips or runways to get airborne, consequently eliminating need for expensive infrastructure
It holds the advantages of multiple UAVs combined into one.

METHODOLOGY/APPROACH

We have chosen a tricopter based VTOL configuration:
During takeoff and landing, it will act like a tricopter and when we switch from takeoff mode to forward flight mode, the two front motors will tilt 90 degrees(it will be facing forward, this will be accomplished by using a tilt-rotor mechanism) and act as thrust motors for the plane.
For proof of this concept, we would build a small-scale prototype, keeping the cost to a minimum and test out different configurations and properties like flight duration, battery efficiency, payload, flight range.
It holds the advantages of multiple UAVs combined into one.



TECH STACK

• Software or Hardware required • Software – Ardupilot , Groundcontrol , SITL

• Hardware – Pixhawk Flight Controller, GPS module, Telemetry Module, Raspberry pi, Sensors , Motors and Servos

Novelty Features

- VTOLs have both the characteristics drone as well as an Airplane(Hover like a drone and Fly forward like a airplane).

- As it can vertically take off and land it doesn't require a long runway to be airborne.

- It also has high battery efficiency and speed and can travel further than a drone.

- Due to its faster speed and longer range it can deliver medicines in a very convenient and efficient way

Goals to be Achieved

1. Here our goal will be to increase efficiency range and payload capacity and also get a good knowledge of all the software's used to make it autonomous.
2. After this step we would like to try different configuration of tilt motor mechanisms and setups to make it more efficient.
3. After this we will create the VTOL using high end materials to obtain the best results for commercial use.
4. After launching it commercially we will be creating an application which the remote hospitals can use to order the medicine.

Detailed Video explanation:
Video link - https://bit.ly/Centuriton_teamphoenix

TEAM DETAILS

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