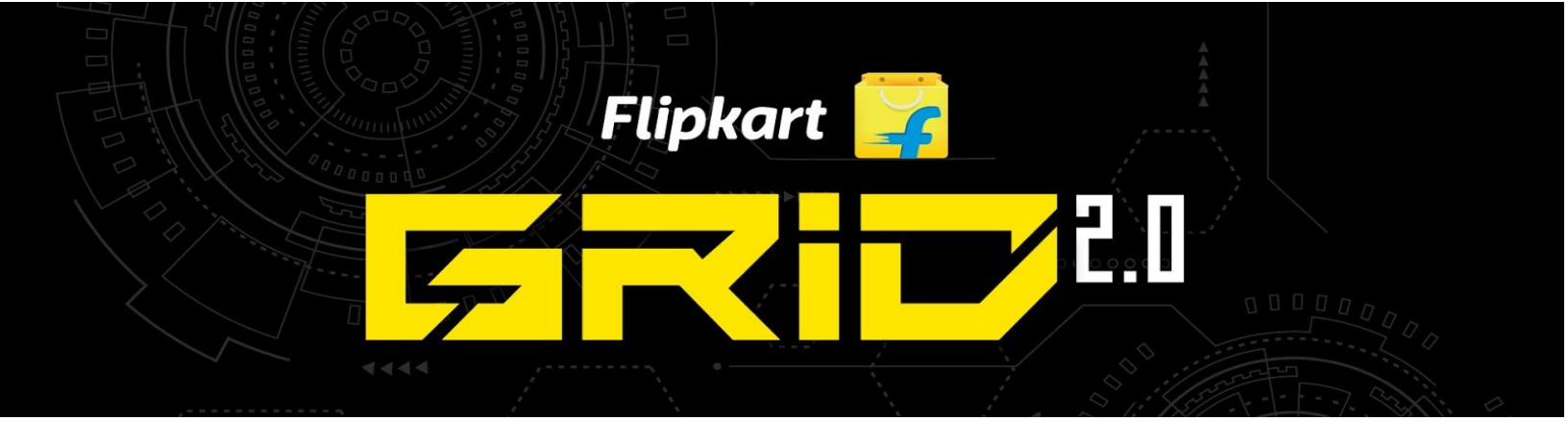

Autonomous Indoor Drone

Brief

Drones have recently garnered a lot of attention in all sorts of domains including supply chain. While autonomous drones have achieved decent maturity in outdoor environments, the conventional drones still struggle to perform in an indoor environment such as a warehouse. The main reason for this comes from the fact that in outdoor environments, drones could rely on global navigation systems such as GPS for their position and velocity estimates. However when it comes to an indoor environment there is a lot of scope of innovation of sensors and processing.

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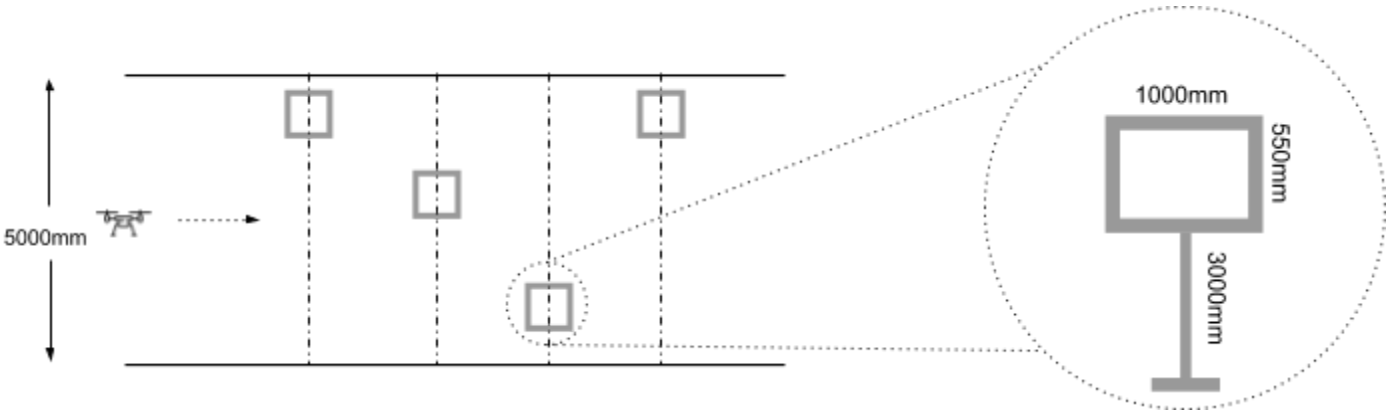
Details

1. **Objective :**
    a. The objective of the problem statement is to come up with an autonomous drone which is capable to travel along a predefined trajectory
    b. The drone should be able to course correct the trajectory to be able to achieve objectives such as crossing through some square frames (gate) or avoiding obstacles in its path
    c. Parameters :
        i. Multi-rotor drone
        ii. Minimum payload : 2 Kg
        iii. Navigate in the aisle width of 5000mm
        iv. Autopilot, PID controlled & obstacle avoidance features

2. **Trajectory Specification**
    a. The drone will travel along a straight aisle.
    b. The aisle will have 15 gates which the drone has to pass through.
    c. The gates can be placed anywhere in the aisle but will stay perpendicular to the aisle.

3. **Gate Specification**
    a. The gate will be a rectangular frame 550 x 1000 mm (L x B)
    b. The gate will be mounted on a frame at the height of 3000mm

Flipkart GRiD 2.0



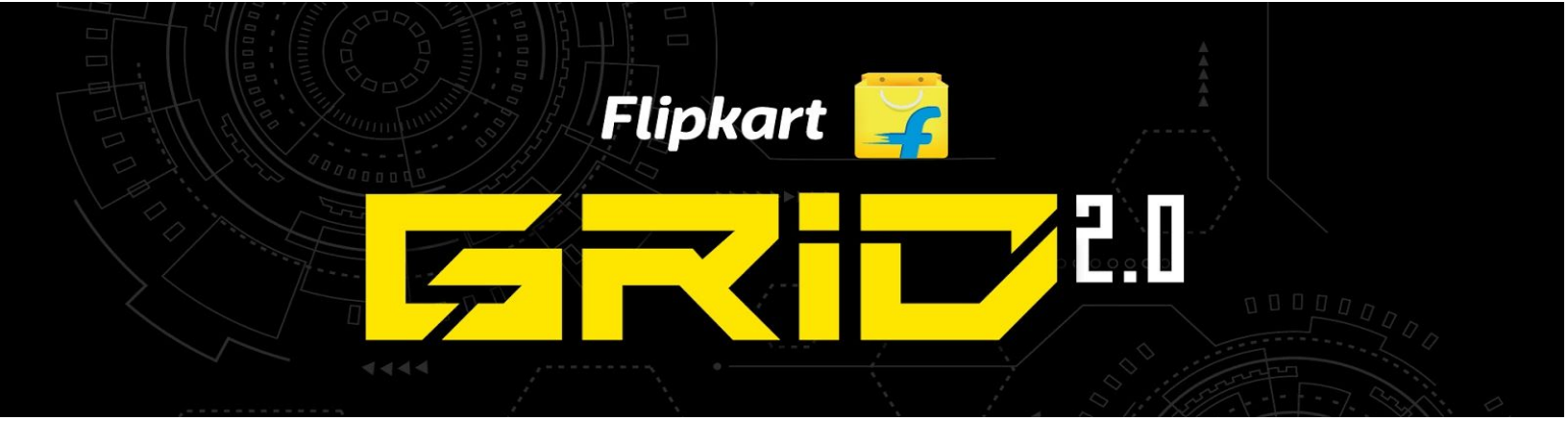
Deliverables

Proposal Submission Phase I (Focus on this for Phase I)

1. 3D models, CAD drawings or even detailed hand drawn sketches on paper work if they are well thought out. The idea is to understand the solution at breadth and evaluate its feasibility.
2. If you are proposing a software/image processing based solution, share the references and research in brief that helped you arrive at the proposed solution.
3. Include the tentative execution plan with high level action items that helps us understand how you can reach from the whiteboard to a prototype and how your expertise enables you to do that.
4. Refer to the Phase I proposal template for further details.

Proposal Submission Phase II

5. Detailed 3D model, CAD drawings, Simulations of the robotic system you are trying to build along with the block diagrams of the different components you plan to use, such as cameras, motors, sensors, microcontrollers/PC. The more detailed the document the better.
6. List of components/software(s) required for the solution along with specifications and tentative cost (BOM & BOQ)
7. Details around the software aspects of the robot in terms of tech stack and algorithms used.
8. Detailed execution plan with timelines and requirements (if any).
9. Further details can be asked for on the basis of the proposed solution by the team.



Finale

10. The participants are expected to build their own drone (both hardware and software) which is able to meet the above objective. In case any third party hardware kits/software is being used participants need to declare it.
11. The Drone should navigate autonomously once it takes off and should not expect external inputs.

Judging Criteria

12. Time taken to complete the course
13. Number of gates the drone successfully passed through
14. Penalty for any hits or if the drone goes off the track
15. Grip and steadiness of the drone while navigating with the load. There will be penalties awarded if packages fall off the drone.

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