Precise Control Drone

The Cheapest Drone with Uncompromised Quality

ABSTRACT:

With the advancement of technology, the use of unmanned aerial vehicles (UAV) or drones is increasing rapidly at an exponential rate both locally and globally. However, the price of drones is also rising with the rise of demand in the market. We aim to create a low-cost, precise-controlled drone with obstacle avoidance features that can be used for a wider range of applications. We have designed an advanced flight controller by integrating different sensors and found that it is possible to build a precise-controlled drone with a budget of 20,000 BDT, which is less priced but with quality ensured.

Method with System Diagram:

We have designed the primary unit of the flight controller by integrating MPU6050, BMP280, GPS, and Arduino Nano. Later, we implemented obstacle avoidance features using six ultrasonic sonar sensors HC-SR05 capable of detecting objects in six directions. We have designed our system in such a way that in indoor conditions, if the GPS signal strength is poor, the drone can be controlled using the MPU6050 sensor, and in outdoor conditions, the drone can be controlled using both GPS and MPU6050 sensors. The design is simple, and we have kept enough options for further sensor attachment and modification.
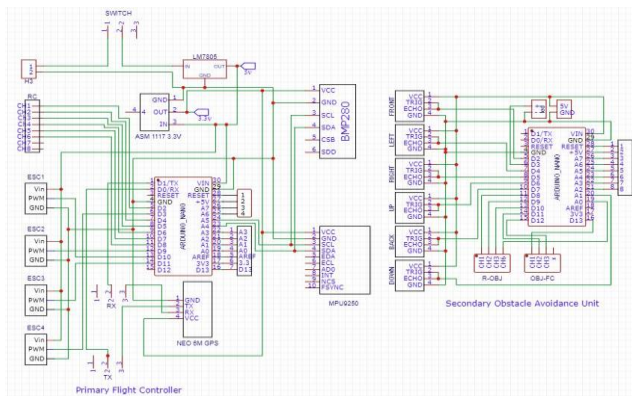

Figure 1: Schematic Diagram of Precise Controlled Drone

Novelty of Project:

Drone technology is rapidly advancing with time and increasing demand. But sometimes, budget becomes a barrier for some individuals or small organizations from receiving the advantage of using this technology in their workspace. The price of the drone that we have built is too cheap compared to other professional drones available on the market. However, the quality and functionality are not compromised, and that's the novelty of this project.

Impact on society and environment:

Precise-controlled drones can bring about many environmental benefits because of their ability to collect data, monitor ecosystems, and perform given tasks with high accuracy and minimal ecological impact. These drones can increase productivity and reduce resource consumption if used in several fields, including agriculture, wildlife conservation, disaster response, etc.

Business Model, Feasibility and Financial Scalability Plan:
In Bangladesh, the revenue generated from drones in 2024 is approximately $2.9 million USD, but unfortunately, we don't have any local manufacturers in our country. This demand is met by importing drones from China. If we can produce this drone locally at a lower price and ensure quality, the dependency on Chinese drones will be significantly reduced. In the case of mass production, we can manufacture almost every component used in this drone locally. After mitigating the local demand, we can export this drone to other countries and generate revenue.

Conclusion:
We have already finished building and testing the prototype in different real-world situations. We have achieved precision in all cases. The object avoidance feature implemented on this budget drone also works flawlessly. We are working on further optimization and product design to provide a professional outlook.