SMART SEARCH DRONE

Capstone 2.0

Team 6

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Background

- Problem statement

Search and rescue missions can be incredibly difficult and time-consuming and human searchers can miss critical. To address these challenges, we propose developing a smart search drone that can replace human searchers in search and rescue missions. This drone would be equipped with advanced sensors and machine learning algorithms that would allow it to scan large areas quickly and accurately.

- Objective

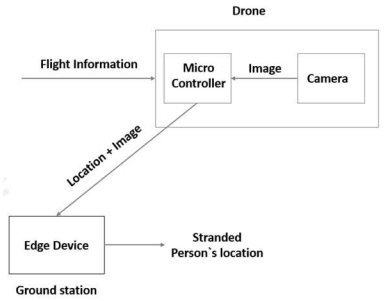
To design a reliable, efficient, and cost-effective solution to enhance search and rescue operations and ultimately save more lives.

- Constrains

- Heavy Wind
- Limited battery life
- Connection uncertainty
- GACA rules for aviation

Prototype Design

The main function of the product is a drone that can be dispatched to specific remote or hard to reach areas to find the location of stranded people.



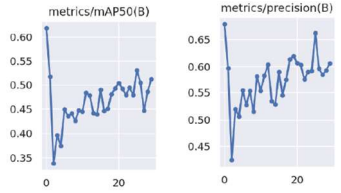
The ground station will be a containerized server that receives the images and location from the raspberry pi chip inside the drone. Then the server will take the image and run through the trained AI model to determine if there is a human or not

The drone has been designed with four brushless motors.

Validation

Calculations and simulations were performed on the Ecalc website for drone specifications to ensure that the drone meets all necessary requirements and specifications.

The accuracy of the AI model is 60% and its precision is 70%



Target Specifications

❑ Drone Specifications

- Drone Weight → 0.2-7 (Kg)
- Flight Range → 0.1-2 (Km)
- Drone Width → 35-50 (cm)
- Drone Hight → 45-65(cm)
- Flight Duration → 15-45 (Min)
- Velocity → 20-140 (Km/h)
- Battery → 3000-5500 (mAh)

❑ Computing and Camera Specifications

- Image resolution → 9-12 (Mp)
- Image Recognition accuracy → 50-80 (%)
- Notification Time → 0.5-1 (S)

Conclusion

The project has developed a smart search drone that can scan large areas accurately and quickly, replacing human searchers in search and rescue operations. Further testing and refining will optimize its performance and expand its potential applications, revolutionizing search and rescue missions and improving the chances of saving lives in critical situations.