Autonomous Target Scoring Drone

Team members: Bert Yu (Cpe), Eric Rodriguez (Cpe), Bibek Adhikari (Cpe), Sukhmanjit Kaur (EE)
Project Advisor: Zaher M. Kassas
Department of Electrical Engineering and Computer Science

Objective: Design a system that enables a drone to fly and score targets located at predetermined GPS coordinates.

Purpose: The Navy has the need to score their mortar testings. However their current system is very inefficient, because it requires manual drone flying and manual scoring.

The purpose of our project is to streamline that process, and rather than have them do it all manual, it will now be autonomous.

Milestones:

-Autonomous Flight
-Image Recognition of Targets
-Assembling the Two Components Together
-Transmitting data to base station

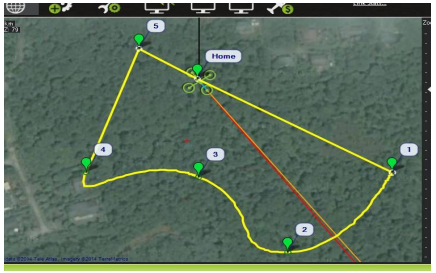
Materials:

- Raspberry Pi - Serves as the base for the drone
- Camera - Connects to the Pi and takes pictures at the location. It is later processed via the Pi.
- Bluetooth Transponders - Allow the drone and the base to communicate
- General Drone Components - Things such as motors and speed controllers which allow for flight.

Software Design:
Scoring: The camera will take a picture of the field from high above. Afterwards, it will scan through the pixels and group up the hits and the misses. Afterwards it will compare them based off our scoring algorithm.

Hardware Design:
The drone will be equipped with a camera and some sort of device that allows for bluetooth/connection to the base station. Additionally an LED will indicate which mode and which data is available for collection.

Challenges Faced:
Perfect autonomous flight is difficult simply because of how many environmental factors there are.
Image Recognition is difficult for a similar reason: Trying to pick out the targets from a large airborne view.



Reference:

https://www.researchgate.net/publication/224248456_The_Technology_of_Image_Processing_Used_in_Automatic_Target-Scoring_System
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