



Advanced Design Project/Advanced Research Project

Dynamic Obstacle Detection and Avoidance for an Unmanned Aerial Vehicle

Background

In the low-altitude airspace, the operations of UAVs (Unmanned Aerial Vehicles) are threatened by a variety of aerial obstacles, such as non-cooperative aircrafts (manned and unmanned), or birds. Collision with these dynamic objects have become one of the cause of drone accidents and could limit a widespread use of drones in the near future. In order to perceive these threats effectively, UAVs can be equipped with onboard sensors to sense the surrounding environment. Compared with radar and ultrasonic sensors, cameras are low-cost, light-weight, and can collect color and textual information. Thus, camera systems are an appealing alternative with a high development and integration potential.

Objectives

A detect and avoid algorithm for the static obstacle has been developed on a UAV prototype. The aerial obstacle of this project is dynamic. Therefore the algorithm will be optimized and adapted in case that the algorithm performance for the dynamic obstacle does not meet the expected metrics as the static obstacle. Finally, an experiment should be design and the developed algorithm will be tested accordingly. The algorithm includes/handles:

- Dynamic obstacle recognition
- Relative position estimation
- Collision probability computation
- Evasive maneuver planning

Requirements

- Interest in computer vision and UAV
- Experience in programming (Python or C)
- Thesis in English

Organizational

- Begin from April

Contact

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