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MATHEMATICS AND COMPUTER SCIENCE

PROBLEM

Autonomously take off from a landing pad, Navigate through a set of GPS way-points and return to the landing pad.

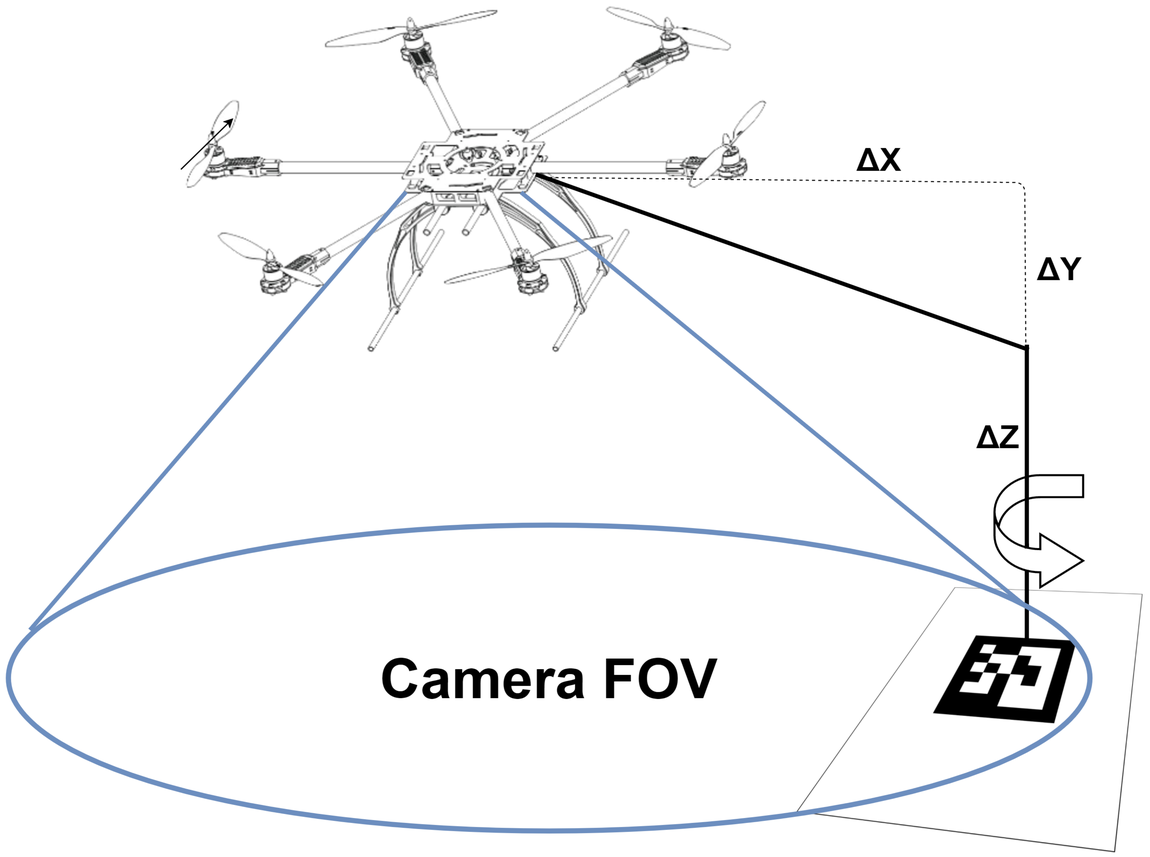
Autonomously land on the landing pad with minimal distance and orientation error.

APPROACH

Use off the shelf capabilities of the Pix-hawk to solve GPS waypoint navigation.

Use freely available AR Tracking li-brary and Visual Odometry libraries to solve localization and landing problem.

SYTSTEM OVERVIEW



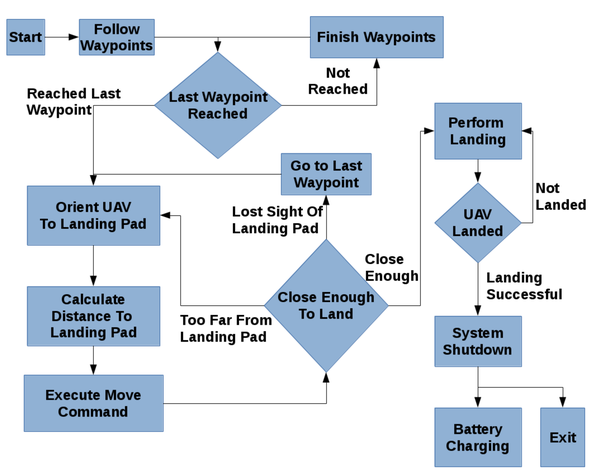
HARDWARE

Turnigy Talon Hexcopter V2.0
ODROID XU4
Pixhawk Flight Controller
Firefly MV Camera
3DR uBlox GPS

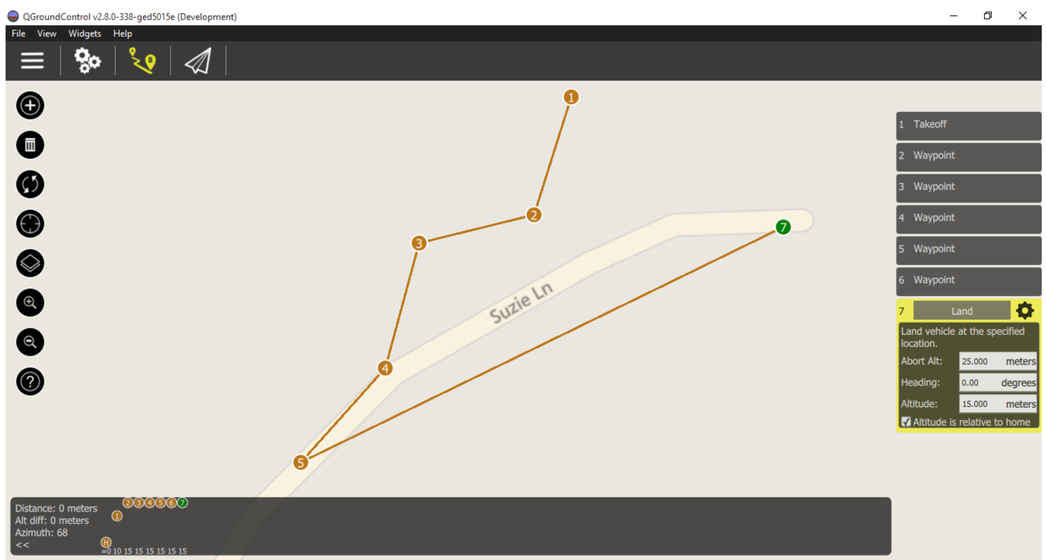
SOFTWARE

ROS Indigo
MAVROS
QGroundControl
AR Track Alvar
OpenCV
Python

LANDING FLOWCHART



WAYPOINT PLANNING



SOFTWARE OVERVIEW