UAV Autonomous Landing

Team Expeditus

SDSMT MCS

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UAV Autonomous Landing Project

Team Expeditus
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Sponsor
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Project Overview

Goal

- receive a set of waypoints
- autonomously take-off
- navigate through waypoints
- return to launch pad
- land on the pad with the correct orientation

Limitations

- landing platform is a fixed position
- landing platform is a stable, horizontal surface
- environment is ideal(no wind, gps available, no obstacles)

User Stories

- **User 1(U-1):**
  As a user, I want to communicate the waypoints to the UAV.
- **Owner 1(O-1):**
  As an owner, I want the UAV to autonomously take-off from the landing pad.
- **Owner 2(O-2):**
  As an owner, I want the UAV to autonomously navigate through a set of waypoints.
- **Owner 3(O-3):**
  As an owner, I want the UAV to autonomously return to the location of the landing pad.
- **Owner 4(O-4):**
  As an owner, I want the UAV to autonomously land on the landing pad without damaging the craft.
- **Owner 5(O-5):**
  As an owner, I want the UAV to autonomously land on the landing pad with the correct orientation.

As a user, I want to communicate the waypoints to the UAV.

Task No.	Task
1	Review previous method/interface for communicating coordinat
2	Review code that communicates with quadrotor
3	Review code that allows a user to input waypoints

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Hardware Requirements

- ODroid XU4
- Pixhawk Flight Controller
- GPS peripheral
- Camera
- Battery
- UAV(Frame, Motors, ESCs, Power Distribution Board)

Software Requirements

- Mavlink
- OpenCV
- Robot Operating System(ROS) Indigo/Jade Distro
- Ubuntu 14.04

Sprint 1

Sprint 2

Sprint 3

Architecture

PLACE HOLDER FOR THIS STUFF: Architecture, Design, Technical Aspects, Data structures, Data ow, Communications, Tools

UAV Design & Tech Specs

Visual Homography Design & Tech Specs

Simulation Design & Tech Specs

Testing

PLACE HOLDER FOR THIS STUFF: Unit or Component Testing, System Testing, System Integration, Remaining backlog, Revised goals and Revised Deliverable

UAV Testing

Manual Flight
Autonomous Flight

Visual Homography Landing Testing

Integration

Remaining Backlog

Revised Goals

Successes and Issues

PLACE HOLDER FOR THIS STUFF: Successes (goals met), Issues or problems (goals not met), Risk Analysis, Risk Mitigation, Timeline, Budget/costs, Intellectual Property Aspects, Licensing

Successes

Parts are now in!!

Issues

Parts are now in!! (Our UAV build has been delayed by a semester)
Simulation integration issues
Large Dependencies (If someone's awesomely helpful interface fails or is buggy, we need to address how we can work around it).

Risk Analysis

Risk Mitigation

IP & Licensing

Prototypes and Demos

PLACE HOLDER FOR THIS STUFF: Demos!!

END