

UAV Autonomous Landing

Team Expeditus

Dept. of Computer Science, SDSMT

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Team Expeditus

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Sponsor

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Goal

Software to autonomously take-off, navigate to set waypoints, return to launch pad, and land

Phase Objectives

Phase I

- Build UAV
- Flight Controller Operating Correctly
- Simulation Environment Available

Phase II

- Autonomous landing ready for simulation
- Autonomous landing ready for UAV

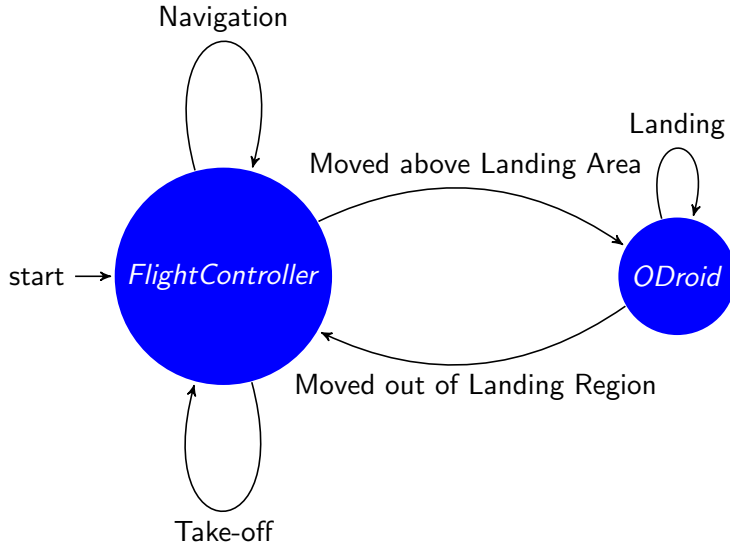
Phase I

- Manual Flight of UAV
- Autonomous Flight of UAV

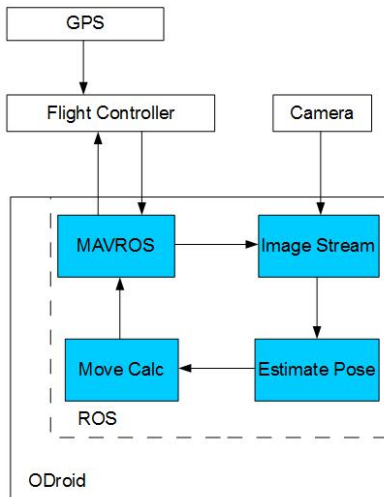
Phase II

- Autonomous Landing in Simulation
- Autonomous Landing of UAV
- Autonomous Take-off, Navigation, and Landing of UAV

Approach - UAV



Approach - Software/Hardware



Approach - Landing Vision

Put some stuff here about the landing vision approach, maybe a picture or two

Approach - Landing AI

Put some stuff here about the landing ANN approach, maybe a picture or two

Development OS: Ubuntu 14.04

Language: C++

Software Tools

- OpenCV
- Robot Operating System(ROS)
- MavROS
- Gazebo
- APM Planner

Build 1:

- S550 Hexrotor Frame, Motors, & ESCs
- Radio Set
- Cameras
- PixHawk Flight Controller
- 3DR Compass/GPS

Build 2:

- 3DR DYI Quadrotor Frame, Motors, & ESCs
- Radio Set
- Cameras
- PixHawk Flight Controller
- 3DR Compass/GPS

Cost

Build 1		Build 2	
Item	Cost	Item	Cost
Controller	\$199.99	Controller	\$199.99
ODroid	\$75.95	ODroid	\$75.95
Sensors	\$167.23	Sensors	\$167.23
Frame Kit	\$242.48		
Power Kit	\$119.98		
Radio Set	\$100.00		
Extra Parts	\$95.15		
TOTAL	\$1000.78	TOTAL	\$443.17

General

- Review previous iteration documentation & code
- Begin pilot training for manual control
- Review Landing Pad model with Landing Pad teams

Setup Development Environment

- Ubuntu 14.04
- Gazebo/Rviz
- ROS - Jade Distro

Inspect Current Quadrotor

- Identify missing or non-functioning components
- Generate order list

Risk

- Reliance on Flight Controller
- Dependency on external team for Landing Pad
- No UAV Backup

Setbacks

- Non-functional components
- Little carry-over from previous year

Conclusion

Conclusion-y stuff here

Questions?