Drones for Humanity

1.0

Milestone One

September 2020

By: Michael Mascari

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1 Team Information

1.1 Names and Emails of Project Members

Name	Email	Position
Michael Mascari	mmascari2017@my.fit.edu	Programmer (Computer Vision/AI)
Ballard Barker	bbarker2017@my.fit.edu	Project Manager/ Structures
Matthew Backert	mbackert2017@my.fit.edu	Systems Engineer
Nicholas Davis	davisn2017@my.fit.edu	Avionics/ Propulsion/ Aerodynamics
Brendan Sanders	bsanders2017@my.fit.edu	Production/ Structures
CJ Gagni	cgagni2019@my.fit.edu	Avionics
Justin Williams	justin2017@my.fit.edu	Propulsion
Hamdan Alblooshi	halblooshi2016@my.fit.edu	Propulsion

1.2 Faculty Advisor

The CS faculty advisor for the project is Dr. Debasis Mitra. dmitra@cs.fit.edu

1.2.1 Faculty Advisor Meeting Dates

- Friday September 11th

1.3 Client

The client is the project team ourselves

1.3.1 Client Meeting Dates

- Friday, August 28th
- Friday, September 4th
- Friday, September 11th
- Friday, September 18th
- Friday, September 25th

1.3.2 Client Feedback

- Client is very happy with the progress made on finding a cheap camera and a way to attach the camera. Client is also very happy with finding a database of thermal images of fire that can be used to train a neural network.

2 Project Details

2.1 Progress of Milestone 1

Task	Completion %	To do
1. Investigate tools	100%	none
2. Hello World demos	0%	Cannot complete until the team is in possession of the Pi/camera
3. Requirement Document	100%	none
4. Design Document	100%	none
5. Test Plan	100%	none
6. Investigate Python libraries	100%	none
7. Investigate simulation software	50%	CS team member investigated Mission Planner and found it to be insufficient. Rest of the team wants to move forward with it.

2.2 Discussion of Tasks in Milestone 1

Task 1: The Raspberry Pi and camera have been selected. They are the only two tools required for the CS part of the project.

Task 2: Since the HSDC was delayed in opening this year, no hello world demo could be achieved with the hardware by milestone 1.

Task 3: See requirement document

Task 4: See design document

Task 5: See test plan

Task 6: Libraries that are planned for use: OpenCV, TensorFlow, NumPy, sklearn, and adafruit.

Task 7: The rest of the team want to move forward on Mission Planner as simulation software. That software does not seem usable as simulation for autonomous flight, or drones that receive new instructions mid-flight. The CS part of the team has voiced concern but has been ignored because the rest of the team does not recognize the need. Programming an autonomous simulator might need to be an upcoming task.

2.3 Plan for Milestone 2

Program/Train Neural Network to be able to identify/classify fire if given a thermal image. Since this is the main part of the project, I believe giving it the majority of a milestone is expected.

Purchase the Raspberry Pi/Thermal Camera. They have been selected, but now they need to be purchased and hopefully have time to do hello world demos with them. The team was asked if it was feasible to purchase these items before the end of next milestone and they said they believe so.

3 Faculty Advisor Tasks

3.1 Faculty Advisor Feedback

Task 1: Reference to the thermal image database needed in the report.

Task 2: Ok

Task 3: Ok

Task 4: Ok

Task 5: Ok

Task 6: Ok but start playing with created CNN to detect the presence of a “fire” or something.

Task 7: Lacking, for now.

Faculty Advisor Signature: ___Debasis Mitra_____ Date: ___9/25/2020___