Problem & Users

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Project Overview

MicroCART: Microprocessor Controlled Aerial Robotics Team

- Design mini quadcopter platform to be used in CPRE 488 and for Controls & Embedded Systems researchers
- Develop mini quadcopter printed circuit board (PCB), containing a Microcontroller, RF, IMU, and Wi-fi chip
- Develop software to stabilize and communicate
- Develop base-station to communicate with quadcopter
- Create documentation and video tutorials for future teams

Problem Statement

- Design a compact, user-friendly quadcopter platform with integrated hardware and software to be used for hands-on learning in CPRE 488.

- Ensure both remote accessibility and usability for future users through documentation and tutorials

Purpose:

The purpose of this, and every other, lightning talk is to identify and communicate your initial ideas and outcomes related to key aspects of your design process. This process allows you to create an early artifact of your thinking, gain critical feedback from the instructional team and your peers, and support iteration in your project.

Task:

Create a short presentation (five minutes maximum) detailing the week's topic. This lightning talk is focused on the overarching problem and your target users. This talk should include the following information, but you may include additional or alternative sections:

- Project Overview
- Problem statement
- List and description of users (e.g., personas)
- User needs
- Conclusions

Each team should create and submit a set of slides each week (.pptx or .pdf). Additionally, each week, up to four teams will present their lightning talks in class.

Grading:

Lightning talks are formative (i.e., to help you clarify ideas and get feedback). Thus, they will be graded more for completion and effort.

10 points - All important section aspects covered, evidence of thoughtful work

8 points - All important section aspects covered, evidence of some sloppiness or carelessness

6 points - Most important section aspects covered

4 points - Presentation is relevant to section but misses several key elements or shows lack of consideration

2 points - At least it's a coherent presentation

Users (In order of highest to lowest focus)

- CPRE 488 Students
- Successor Project Team
- Project Advisor/TAs
- Prospective ISU students

Persona 1.) 488 Students

- Senior/Graduate level students
  - Must have completed CPRE 381 or COMS 321
  - Must be able to perform with Mini-Quadcopters after 4 intro labs
    - Will need to write code such that can obtain extra credit
  - Limited amount of time they can dedicate solely to this class

Persona 2.) Successor Project Teams

- Senior level students who are working on this same project
  - Senior level knowledge base
    - Multiple disciplines (i.e.: CPR E, E E)
  - Will be working off of what we conclude with

Persona 4.) Prospective ISU students

- High-level course knowledge
- May have seen previous projects done and performed
- Observing to see if our project and students' work meets task requirements
- Limited time, more responsibilities

Persona 4.)

- Highschool level knowledge
- Want to attract them to be like us
- May have interests in other fields
  - Need to show how this connects to other ISU disciplines

General User Needs

- To be understandable and easy to get started with
  - Cannot take too long else will bore users
- Needs to have documentation for other people to adapt to
- Work that we leave behind for other students must be able to be experimented on and modified
- To show how this connects to other disciplines

Conclusions

- Despite working on a rather complex subject, we will need to compress what we are doing down into a simple and easy to understand, well-documented format.
- This format will then be further divided into sections for who is required to learn what so that less people will be confused by what is being learnt at the time

Works Cited

- Getty Images. “Royalty Free Stock Photos, Illustrations, Vector Art and Video Clips | Getty Images.” *Gettyimages.com*, 2019, www.gettyimages.com/.
    - Author/creditor is shown in each image
- Jones. “CprE 488 - Embedded Systems Design.” Iowa State University, https://class.ece.iastate.edu/cpre488/schedule.asp