QuadCopter

ECE 401 Presentation

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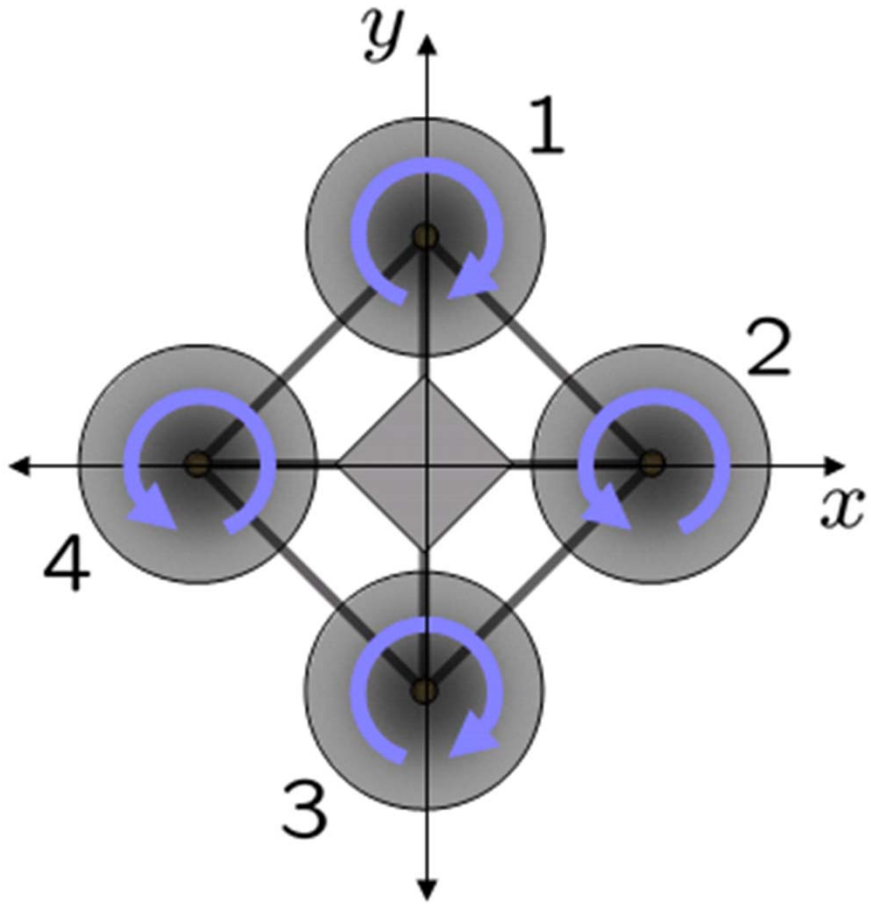
Our Team

Our Project

Quadcopter

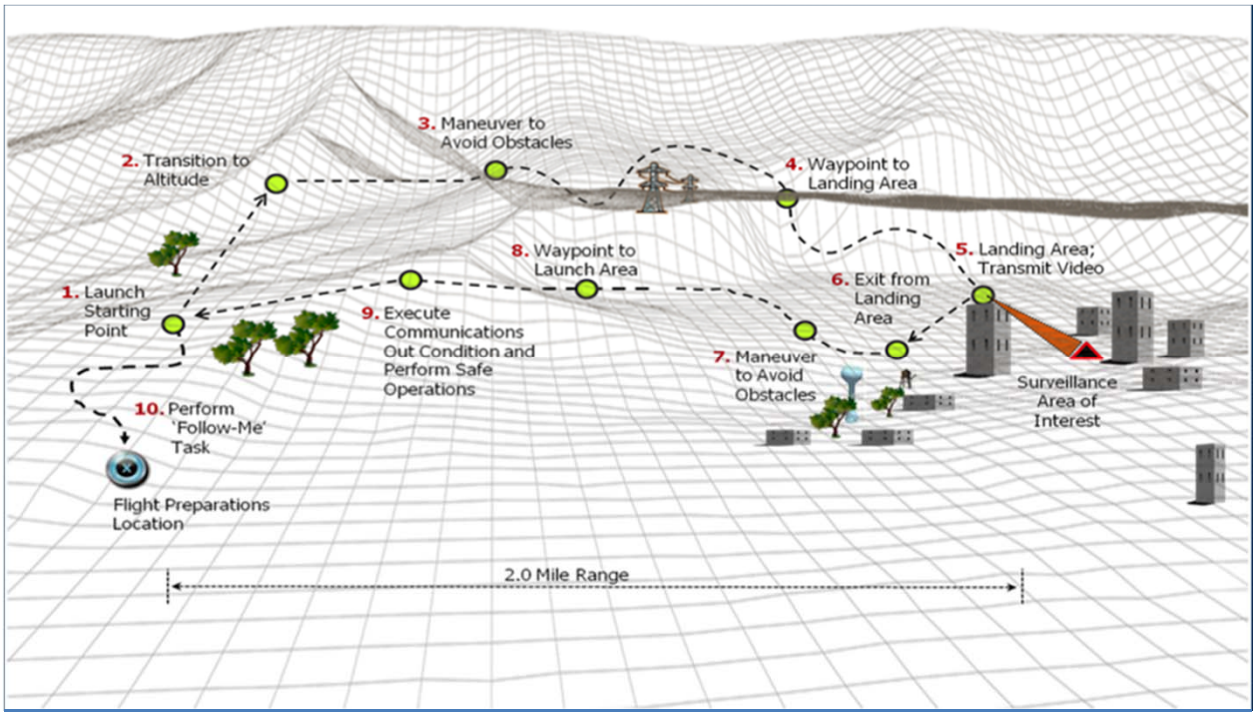
- 4 propellers
- Ability to hover in a stationary position
- High maneuverability
- Many practical uses



http://en.wikipedia.org/wiki/File:Quadrotor_yaw_torque.png

Project Goals

- Based off budget constraints
- 1 hour battery life
- Communication radius up to 2 miles
- Altitude ceiling of 1,000 feet
- Surveillance
- Portable

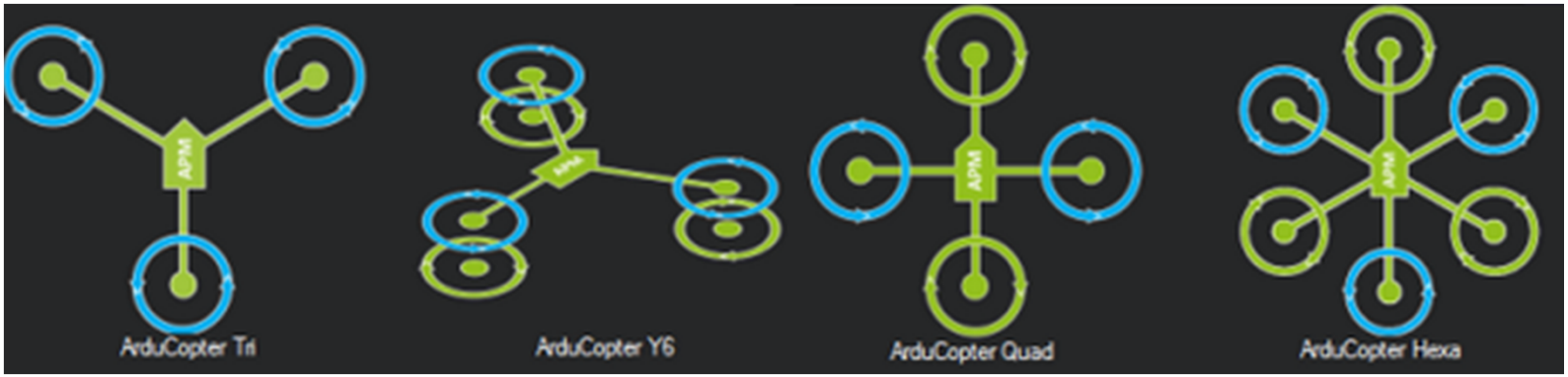


http://www.uavforge.net/

Concept Exploration

- Looked at different types of UAV structures and decided to use the helicopter
- Looked at many different types

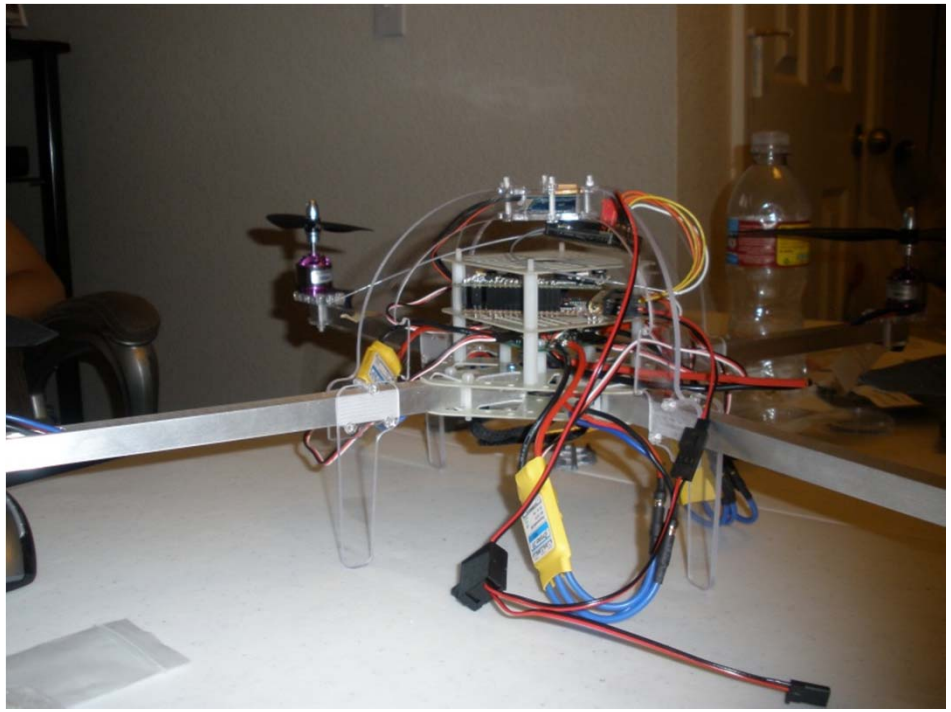
  of helicopters
- Different types of electronics such as microcontroller and camera.



http://code.google.com/p/arducopter/wiki/AC2_Loading

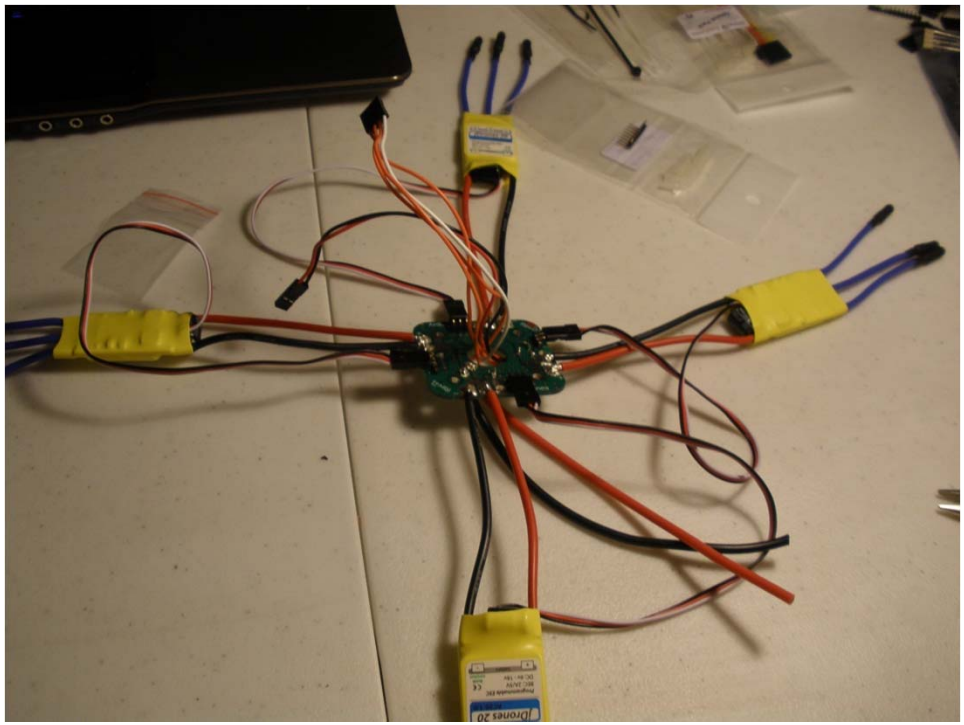
Systems

- Four systems of the Quadcopter
  - Power
  - Electronic hardware
  - Mechanical hardware
  - Software



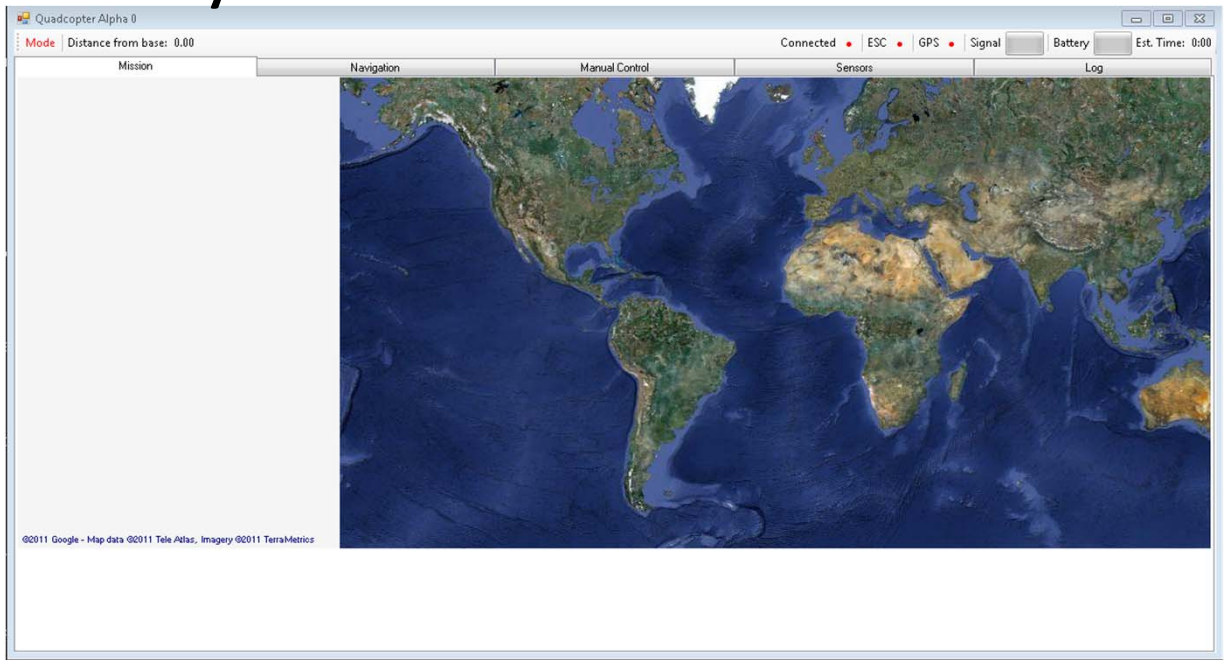
Testing and Development

- Testing of individual components
- Introducing new hardware



Graphical User Interface

- Written in C#
- Uses GMap.NET library for Google Maps integration
- Will have the ability to interact with the with the Arduino



Risks and Complications

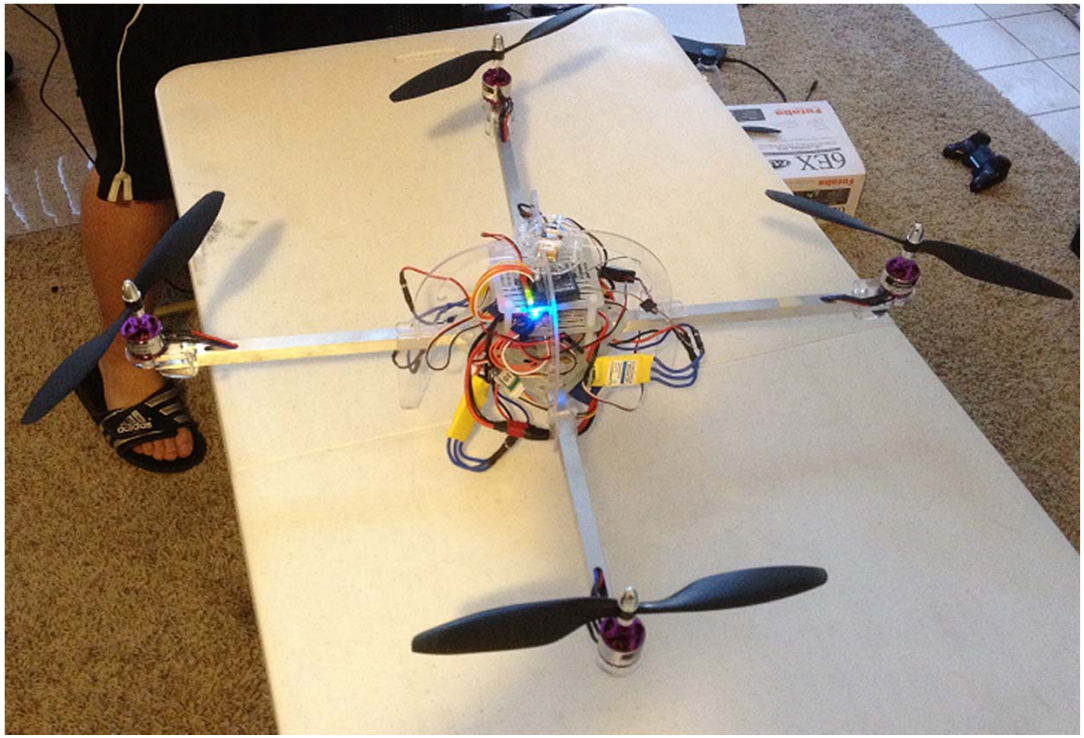
- Integration between GUI and hardware
- Taking the helicopter beyond its own limits
- No failsafe capabilities

Budget

object	cost	reason
futaba 6 channel 2.4GHz transmitter and reciever	199.99	to control the heli
battery charger and balancing board	89.99	this charges the battery and makes sure the cells are charged at the same rate (battery last longer)
	5.95	connector for the battery to the power distribution board
Double sided tape (vibration)	2.89	this was put on the bottom of the board to help prevent vibration
Soldering tip (1/64)	6.45	needed a lot finer tip in order to do the soldering on the board
solder	2.89	needed solder
electrical tape	2.19	for wires that the rubber could not cover
x 10 header female 08POS .1"	12	
1x20 right Angle Pin headers	1	
3x8 right angle pin headers	1.99	
2x arms for the body	9	
2x propeller set	12	
4x motor	72	
ESC (power the motors)	72	
Xbee Telemetry kit	150	
Full ArduPilot Mega kit	250	
Lipo battery 2200 MAH	22.88	
2x4 wood	6.06	needed wood to solder the button connectors correctly
Dean connectors (male)	3.75	
gps	29.99	
soldering iron	149.99	
servo leads (longer cables)	5.9	spare parts
2S-3S	5.39	to get battery level prediction working
camera	54.96	to have a camera.....
1x motor	18	
1x ESC	18	
2X propeller	12	
6X propeller	45	
sonar / propellers	80	
cables	7	
Total cost so far	1349.26	

Next Semester Plans

- Finish and integrate the GUI
- Examine new hardware possibilities
- Explore new body ideas



DEMO

Video

Questions?