

USER STORIES

- As a user, I would like to be able to control the quadcopter regardless of distance.
- As a user, I would like to control my quadcopter from my computer/mobile device through either a keyboard or controller or touch interface.
- As a user, I want the system to react to my commands instantly.
- As a user, I would like the quadcopter to be able to do sweet flips.
- As a user, I would like it to be able to stream real-time video in order to fly the quadcopter outside of my field of view.
- As a user, I would like to see speed and altitude displayed on screen
- As a user, I would like to record a video/photo.
- As a user, I would like to be notified if the battery is critically low, to avoid accidents.
- As a user, I would like my quadcopter to land safely in case of emergency.
- As a user, I would like to be the only one who is able to connect and control the quadcopter at any given moment.
- As a user, I would like my quadcopter to play music/sound
- As a user, I would like to view my quads position on a map
- As a user, I would like to set waypoints for my quadcopter to fly to
- As a user, I would like my quadcopter to operate safely
- (As a user, I would like my quadcopter to react to motion and its environment, in order to steer it without controller.)
- (As a user, I would like my quadcopter to be able to transport stuff, for example, sushi and beer.)
- (As a user, I would like to use a microphone to send sounds to pi)
- (As a user, I would like my quadcopter to map out corridors)
- (As a user, I would like to script a sequence of commands for my quad)
- (As a user, I want to be guided through the software)

REQUIREMENTS

Functional

- quad can be steered via a (xbox) controller, keyboard, or mobile device
 - controls for throttle, roll, pitch, etc. are mapped on the keyboard/controller/mobile app
- quad streams video from the first person view to a computer/mobile device via internet
- quad streams altitude, speed, battery life.
- quad receives commands via internet
- quad plays/streams sounds/music from another computer/SD card
- quad lands safely if the internet connection is lost or client is lost or its battery is low
- user needs to log in to use the quadcopter
- user can add waypoints to which the quadcopter can navigate
- user can record the video stream or take pictures
- ground control software has a log-in screen
- ground control software displays battery status
- ground control software displays the video stream
- ground control displays map and location of the quadcopter
- ground control software displays a visual representation of the control values

Non Functional

- quad should be stable in flight and easy to steer
- ground control software should run on different operating systems/mobile devices
- video stream should be in real time, stable and display enough detail to navigate by.
- Software should be open source and extendable

USE CASE DESCRIPTION

description

(...)

trigger

1. the ground control software is started
2. the quadcopter is started

actors

1. user/pilot
2. ground control software
3. raspberry pi/quadcopter

preconditions

1. quadcopter has battery and is ready to fly
2. computer/mobile phone has an internet connection
3. computer/mobile phone has enough battery

goals

1. fly the quadcopter
2. ...

failed conclusion

(...)

extensions

(...)

steps of execution

1. Log in to ground control software
2. Run pre-flight checks
3. Check video feed
4. Arm it
5. Play music
6. Take off
7. Using video feed for reference, navigate within a 3D space (even if out of direct line of sight)
8. Record video
9. Monitor speed, battery status, and altitude.
10. View location of the quadcopter on map
11. Place waypoints
12. Do some sick flips
13. Execute the landing in a controlled manner.

