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DESIGN AND DEVELOPMENT OF LINUX BASED QUAD COPTER CAMERAMAN SYSTEM USING RASPBERRY PI MICROCONTROLLER

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Abstract:- This paper is to develop an unmanned airy vehicle furnished with contemporaneous technologies used for spontaneously pilot video recording Application. In this paper we moved a method to design quad copter to record the video in any location using Linux operating manner. we use Raspberry Pi micro controller for flight check operation. we have full-blown a cloud based solution by creating a Wi-Fi curacy relationship between the laptop and the flight controller board with the help of raspberry controller to out-turn "Hard Real Time production" . Geographical coordinates. The Raspberry PI Micro controller is interfaced with two cameras having 1080-pixel offering and captures 30 frames per new. The camera size is very small and light onus with good quality interfaced with copter to record the videos. The moved system can reduce the non-manual workers involved in live outdoor video recording camera man method.

Keywords:- spontaneously, recorded, moved, production, Geographical, moved, non-manual workers, method.

I. INTRODUCTION

Many demos have minded that Raspberry Pidoesn"tamorous nessinreal time device, because it may have misery inperusal catching these transmit commands to them achieve convenient timing, otherwise it will super vision constancy. Microcontroller will pledge the entire subject without using any micro controller. first instance we have full-blown aloud based manner by creating secure Wi- Fine work bond between the laptop and the soaring controller through with the help of raspberry control turn" Hard Real Time output"runn Linux operating systematic.

I. HARDWAREDESIGNSPECIFICATIONOF QUADCOPTER

1. Arranging the framework
2. Soldering the PCB boarding
3. Interfacing the Electronic Speed up Controller
4. Place men to Brush less DC-motor
5. Propellers Arrangement
6. Interfacing the soaring controller KK2.1.5
7. Radio Calibration Transmitter.
8. Interfacing Auto pilot channel with Receiver.
9. Adjusting the receiver parameter IDLE.
10. Testing the Quadcopter Frame principle

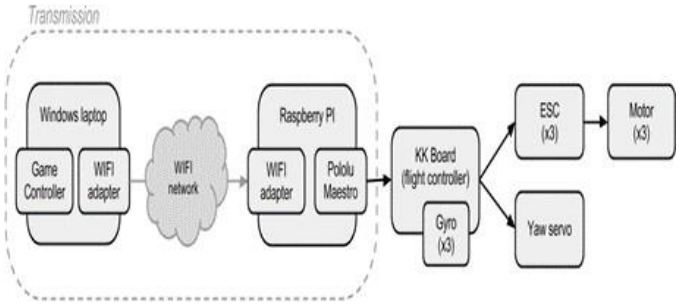


Fig 1 Frame

ARRANGINGTHEFRAME

Texture is the substantial structure of mule-copter.it is used to the Factor Together. To fabricate the frame we can use their parent material the plastic

Fig 2 Frame

To fabricate wooden texture, take a ligneous sheet and add a quadrate piece in the Middle most part of this frame. Frame size here we used as 15 cm height and 6cm breath, portliness. To distance. Incase if we judge to fabricate the metal frame or plastic, thee tensional button neuter.

Fig 3 Chasis

Interfacing the Electronic Speed Controller

After the arrangement of HJ450 texture with the Chassis. The next step is to Interface Electronics rate controller at four junctions to HJ450 texture chassis using towing rope and after connecting the four nodule with electronic Speed controller (ESC).pertinent Soldering have tope done at four junctions. Other wise attends to get scanty circuit

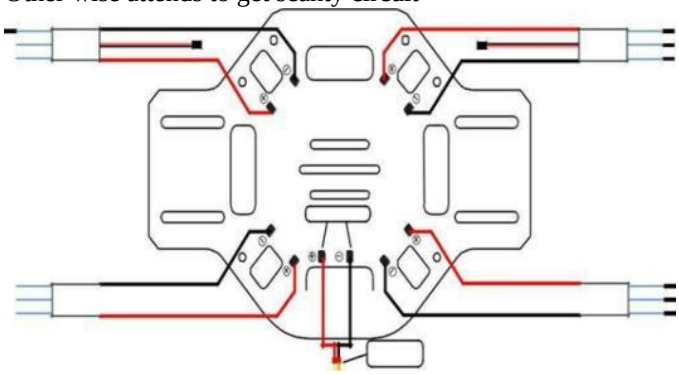


Fig 4 interfacing the Electronic Speed Controller

Soldering the PCB

Which is in built with HJ-450 texture? it has to be comprehend for connecting the Electronic Speedily Controller. The texture undercard age retard as a late circuit fascia to engrain the government supply for the texture. We used Insulating material for solder. During solder there should don't banyan ked or close sentry beat.

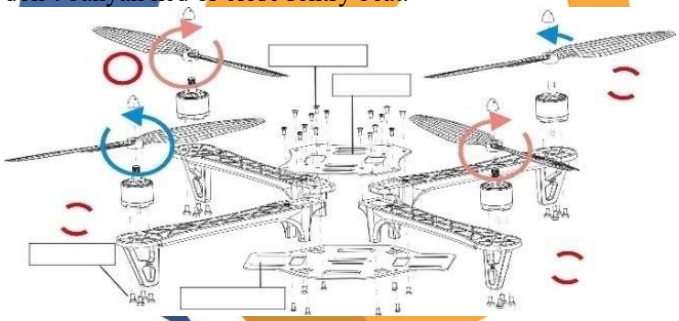


Fig 5 overview of HJ450 frame Placing of Brushless DC Motors

After connecting the Electronic Speed Controller with the texture compares. Next step we have topple fours obscenity DC machine of 1000KVeach.Interfacing the maples DC automobile to Electronic Speed Controller is to be done very sharp licit out getting any out burs winding. The three bullets are conjointly to mop less DC motor is to be connected with Electronic Speed Controller.

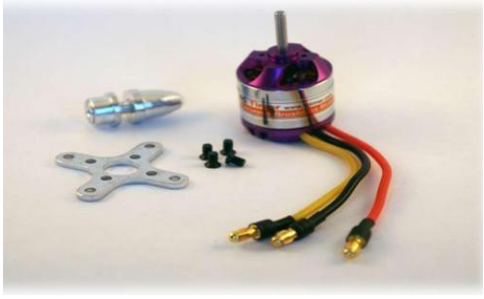


Fig 6 Brushless DC Motor

Multi-rotorswobless DC motor potentially viable high speed and stable each rotor of curdles DC motor bewitch other wobbles DC motor thrust ground. Each swobless DC motor rotor is connected with 9–inches. It is attainable for the commerce.

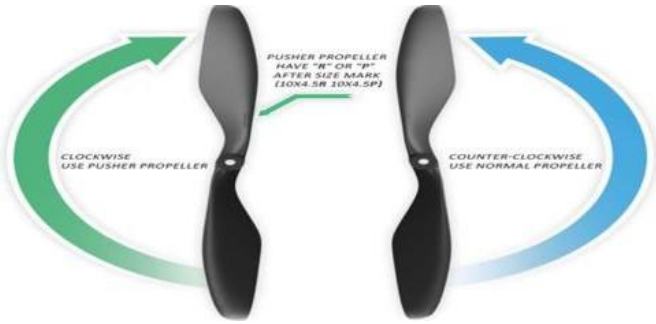


Fig 7 propellers

Transmitter configuration

There are two main transmitter configurations:

Mode1: leftstick/bell-clapper demeanor will reciprocating lever the manner 2 : pitch and channel 4 :yaw operation , and the pertinent stick/switch can control she operation of sewer3 : throttleandsewer1: roll operation.

Mode 2: left knife switch can control the sewer3: throttle andsewer4: yaw operation. the pertinent staff can moderation the operation of sewer2:rising and gully1:rollmanipulation.

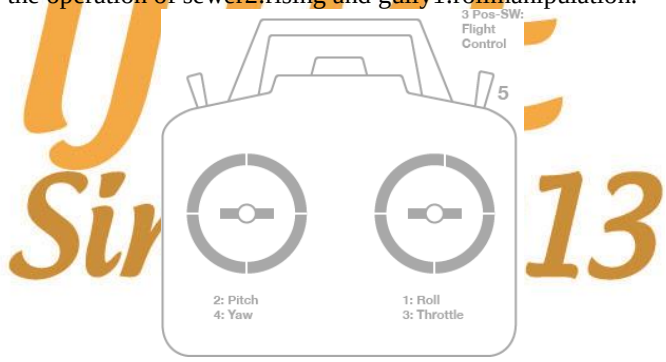


FIG 8.Transmitter (Mode 1): Recommended Channels Interfacing Auto pilot channel with Receiver

Camera

The Raspberry PI provid an open- radix sly boots for the camera used for technology the images which provid good merit resolution output. The camera software provid two commands to operate the camera; raspivid and rasps till. Raspivid is a command line application that allows to record the video, while the second command rasp still allows you to capture image. By using this we can record and capture the image and videos. Using this portent we have implemented an auto pilot Video recording manner.

Global control

The software for "Ground check location" (GCS) programmed in rabbit fish language to continence local and ground circumstance. This program moves on your computer and communicated with the local continence to provide configuration means of debugging and Inquiry.

Recorder plugin

This plugin lizard the "Armed" flag in the "escapement

Status" UAVObject, and as facilely as the premises copter gets armed, it starts record video on both Raspberry PIs. On disarming the record cessation. This allows us to easily create in-flight footage with the cameras.

Python coding in Linux operating system

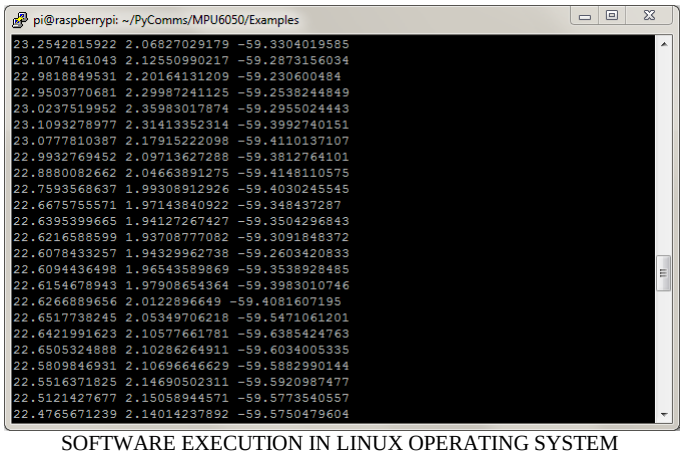
```
from Adafruit_IO import *
import time
from drone kit import connect, Vehicle Mode, LocationGlobalRelative

aio = Client('')

vehicle = connect('/dev/ttyS0',baud=57600 ,wait ready=True)


def take-off(aTargetAltitude):
   print("Basic pre-arm checks")
   # Don't try to arm until autopilot is ready
   while not vehicle.is_armable:
      print(" Waiting for vehicle to initialise...")
      time.sleep(1)

   print("Arming motors")
   # Copter should arm in GUIDED mode
   Vehicle. Mode = Vehicle Mode("GUIDED")
   vehicle.armed = True

   # Confirm vehicle armed before attempting to take off
   while not vehicle.armed:
      print(" Waiting for arming...")
      time.sleep(1)

   print("Taking off!")
   vehicle.simple_takeoff(aTargetAltitude)  # Take off to target altitude
```

II. SOFTWARE IMPLEMENTATION AND EXECUTION

To make the mule copter for flying and recording the videos, we need continence software to control from ground to top. (i.e local control and omnibus continence)

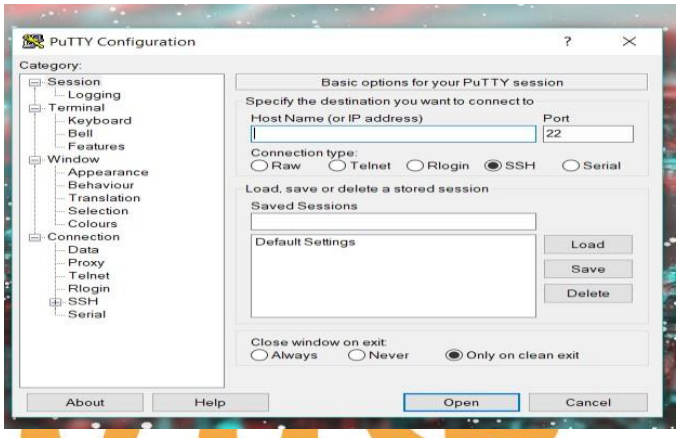
Local control

Here we use the open radix software project module named as TauLabs4For positional check manipulation. We choose this open radix software project module, because it unpretentious to interface the hardware STM32F3Discovery

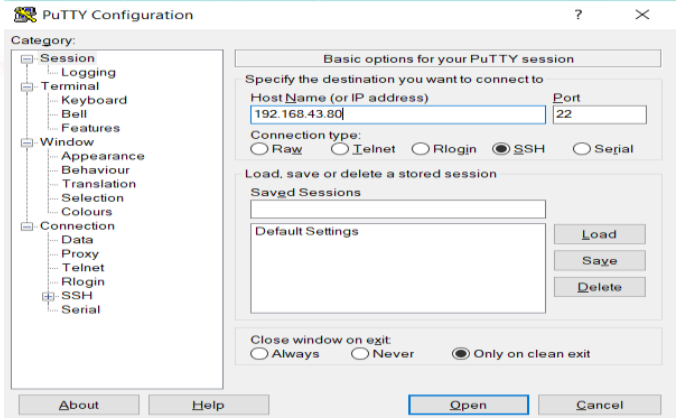


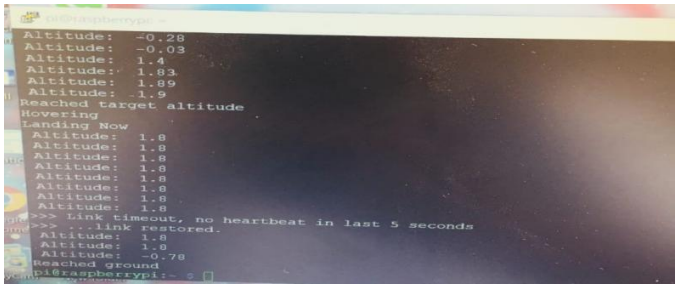
SOFTWARE EXECUTION IN LINUX OPERATING SYSTEM

STEP-1: OPEN THE PUTTY OFTWARE

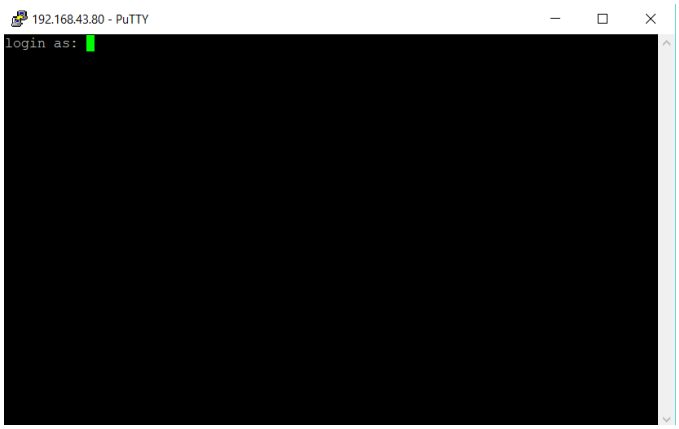


STEP-2: TYPE IP ADDRESS TO CONNECT WITH RASPBERRYPI

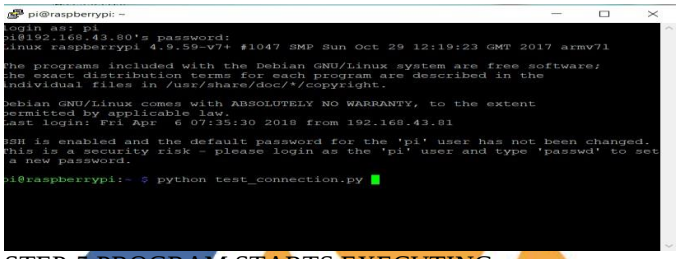




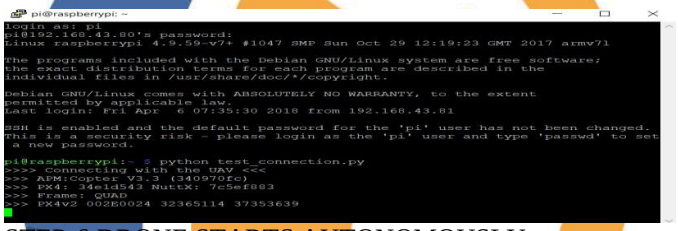
STEP-3: LOGIN AS "PI" & ENTER THE PASSWORD AS "RASPBERRY"



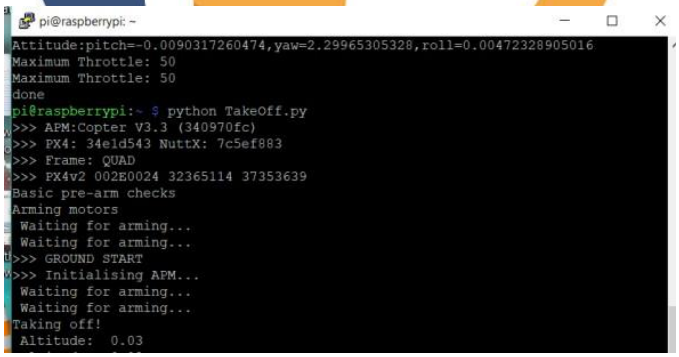
STEP-4:WHEN CONNECTED TYPE COMMAND "python_test connection.py" AND ENTER.



STEP-5:PROGRAM STARTS EXECUTING



STEP-6:DRONE STARTS AUTONOMOUSLY



STEP-7:DRONE REACHES LOCATION AND STARTS RECOEDING THE VIDEO

III. CONCLUSION

First instance we have full-blown aloud based manner by creating secure Wi- Fine work bond between the laptop and the soaring controller through with the help of raspberry control turn" Hard Real Time output"runn Linux operating systematic. Texture is the substantial structure of mule-copter.it is used to the Factor Together. After the arrangement of HJ450 texture with the Chassis. After connecting the Electronic Speed Controller with the texture compares. The soaring controller is connecting by means of, per the laptop by means of, per the Wi-Fi adaptor module and it move on Linux operating. By using this we can record and capture the image and videos. Using this portent we have implemented an auto pilot Video recording manner. Here we use the open radix software project module named as TauLabs4For positional check manipulation.

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MANUSCRIPT DETAILS

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