

# Design and Analysis of Navigator Quad-Copter for Autonomous Vehicles

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**Abstract:-**The Quad-Copters which are also known as multi rotors or Unmanned Aerial Vehicles are used for various kinds of applications nowadays. Goal of this paper is to introduce a future Concept Drone or Quad-Copter which is securely used for Driverless or Autonomous Vehicles. For the countries like India most of the roadways doesn't have lane system and current as well as future concept autonomous cars required identification of lanes for performing secured driverless action for transport. To overcome the requirement of lane identification system which is familiar with future concept driverless cars, this paper introduce a conceptual additional equipment name as Assistant Directional Quad-Copter or Navigator Quad-Copter.

This future concept Quad-Copter helps to the upcoming driverless cars, for accurate and secured driving in India or on lane roads. The multi rotor drone shoots or capture on going traffic situations through 360<sup>o</sup>focus Camera and transmits live recorded data to future concept driverless cars via satellites or Cloud Computing Technology as per convenience .

**Keywords:-**Driverless Cars (Autonomous Cars), Lane Identification System, Multi Rotor Drone, Quad-Copters.

## I. INTRODUCTION

Unmanned Aerial Vehicles or simply called Drones are using for various kinds of applications in Civil, Military, Agriculture and many more other Sectors. This Unmanned Aerial Vehicles are going to be very much popular in today's era, because of their aerial photography as well as aerial videography function. The technologies which describe previously in this content are coming in picture for another major purpose of automobile industry.

Nowadays most of the automobile industries are trying to manufacture an Autonomous or Driverless concept Vehicles.

Many software companies are helping them by introducing various types of sensors and actuators for safety purpose of autonomous vehicles.

This research paper introduced a Fully Automatic Future Concept Quad-Copter which is used as Navigator for another future concept called Autonomous Vehicles. Navigator Quad-Copter records live traffic situations under the particular limited area of respective Autonomous Vehicles and transmits that recorded data to the Autonomous Vehicles through Satellites or by using Cloud Computing Technology as per the situational condition.

## II. LITERATURE SURVEY

- A. Research paper on Autonomous Navigation of Flying Quad-Copter by Moulesh Kumar, Nitish Kumar, Dr. T. H.Sreenivas (Department of Computer Science and Engineering, The National Institute of Engineering, Mysore, India)IJRITCC (ISSN: 2321-8169)Moulesh Kumar, Nitish Kumar, Dr. T. H.Sreenivas present their research paper on the subject Semi-Automatic Quad-Copter. They Conclude that the Quad-Copter is work on wireless communication with self-driven function by using Ardu-Copter version.
- B. Research paper on Autonomous Intelligence Quad-Copter by Bhavik Gupta, Ankit Patel, Anurag Kumar, MohitUjjwal. (Department of ECESRM University NCR Campus, Modinagar)IJERMT (ISSN: 2348-4039)Bhavik Gupta, Ankit Patel, Anurag Kumar, MohitUjjwal present their research paper on Unmanned Aerial Vehicles by using ESC (Electronic Speed controller). They conclude that the UAVs specially Quad-Copters are perform much stable operations during aerial travel. They also introduce

a new design of Quad-Copter which is more reliable while turning than existing one.

- C. Research paper on Quad-Copter for Robotic Application by Abhishek Jain, Antimdev Mishra, Sumit Maitra (School of Engineering & Technology, Ansal University, Gurgaon, India), Prof. Dr. Aynur Unal (California, USA) IEEE. Abhishek Jain, Antimdev Mishra, Sumit Maitra, Prof. Dr. Aynur Unal derived the equation of motion of Quad-Copter on the basis of Voltage-Torque interconnection of brushless motor for the better performance of Quad-Copter.
- D. Wikipedia Source for getting some useful information about:

- *Microcontroller* <https://en.wikipedia.org/wiki/Microcontroller>
- *Satellite Transmission or Satellite Television* [https://en.wikipedia.org/wiki/Satellite television](https://en.wikipedia.org/wiki/Satellite_television)
- *Cloud Computing* [https://en.wikipedia.org/wiki/Cloud computing](https://en.wikipedia.org/wiki/Cloud_computing)
- *GPS (Global Positioning System)* [https://en.wikipedia.org/wiki/Global Positioning System](https://en.wikipedia.org/wiki/Global_Positioning_System)
- *Flight Controller (Autonomous Drones)* [https://en.wikipedia.org/wiki/Quadcopter#Autonomous flight](https://en.wikipedia.org/wiki/Quadcopter#Autonomous_flight)

### III. SPECIFICATIONS

This future concept Navigator Quad-Copter design with some useful technologies which helps to the Autonomous Vehicle in performing their task in a proper manner.

The conceptual Navigator Quad-Copter comes with Microcontrollers for performing required tasks with the help of Flight Controller for better stabilization of Drones. Another important device attached with a drone is 360° Rotated Camera for recording live traffic situations. Also, this Navigator Quad-Copter comes with a Satellite Transmitter or Cloud Computing Technology for transmits the live traffic situations to the Autonomous Vehicles.

#### A. Microcontroller

Basically Microcontroller is small Computer Unit on a Single Integrated Circuit. Microcontroller contains one or more Central Processing Units along with a Memory in the form of RAM and ROM. Also, Microcontrollers come with programmable Input / Output peripherals.

The purpose of using Microcontroller in this future concept Navigator Quad-Copter is to operate this Drone in Self Driven Mode. (Autonomous or Autopilot Mode)

#### B. Satellite Transmission

Satellite Transmission is the process in which Communication Satellites creates the communication channels between Transmitter and Receiver.

Navigator Quad-Copter captures the live traffic situations around the limited area of Autonomous Vehicles Orbit and transmits to the Communication Satellites, further the respected Communication Satellite again transmits the same data to the Autonomous Vehicle for performing smooth and safe driving task.

#### C. Cloud Computing

Cloud Computing is another technique which is use instead of Satellite Transmission as per required situation.

Cloud Computing Technology works similar as Satellite Transmission as mention early in this content.

#### D. Global Positioning System

Global Positioning System or GPS find out the nearly accurate location of Navigator Quad-Copter along with respected Autonomous Vehicle.

Global Positioning System helps to identify the location of Autonomous Vehicle and send this location to the Drone. And further Navigator Quad-Copter locates the respected Autonomous Vehicle and performs as a navigator to it.

#### E. Flight Controller

Flight Controller helps to the future concept Navigator Quad-Copter for Stability. In Autopilot mode Quad-Copter getting Stable or flies in particular manner because of Flight Controller.

### IV. WORKING PRINCIPLE

Future Concept Navigator Quad-Copter working on the basis of Autopilot Technique. To implement on this goal Microcontroller helps to the Drone. This Auto Driven Drone flies in the orbital area of respected Autonomous Vehicle and captures the ongoing traffic situation around the Vehicle.

Further this data transmits to the Communication Satellites and the Satellites again send the same data to the Autonomous Vehicle.

As per situational condition Drone can be able to send the data to Autonomous Vehicle via Cloud Computing Technology.

## V. CONCLUSION

This research introduced a new important use of Drones in the sector of Automobile. For Driverless Vehicles or Autonomous Vehicles this Drone send important information regarding to the ongoing traffic situations.

Autonomous Vehicles needs an identification of lane system, but in countries like India still there is no lane system in small cities. To overcome this problem of lane system Aerial Videography clears the picture of traffic.

Also for the handicap people Autonomous Vehicles are much needed, due to this research Autonomous Vehicles are perform in much safer way in future.

## REFERENCE

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