Gaddi

The Self-Driving Car

Team: Technoobs

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Introduction

21st century is the time of robots. With the modernizing world, everything from airplane to washing machine is turning autonomous. To add something to this era of evolution, we want to build small scale model of an autonomous car.

Due to lack of time and human resources, we will be assuming that most of the obstacles faced by Gaddi, will be have constant velocity.

Components

- **Microproccesor**
  Raspberry pi

- **Servo motors**
  For steering control
  Rear tyres
  Rotation of Ultrasonic Sensor

- **Sensors**
  Ultrasonic Sensor
  Cameras

- **Basic Car components**
  Tyres
  Frame etc.

Work Schedule

Days	
1 to 5	**Buying up components, building up mini car.**
6 to 16	**Setting up ultrasonic sensor on it, improvising it to make obstacle avoider**
17 to 23	**Setting up cameras, code it to get edges & orientation of road**
24 to 30	**Setting up UI for destination & Navigation**
30 to 35	**Minor Debugging**

Demonstration

Our autonomous car would be able to achieve following targets,

Avoid Obstacles

We'r going to dedicate 10 days for hunching the UltraSonic Sensor at top of the car & code it to avoid obstacles, deciding best path by observing its nature. Starting with static obstacles, we'll make our environment more & more dynamic & making our car settle in this. Ultrasonic sensor will be hunched on a continuously rotating stepper motor to cover the front view.

Stay on Track

An autonomous car should be able to keep its track perpendicular to road, & avoid going off track. This'll be done using cameras at both sides of car. Using image processing, we'll attain edges of road, & will keep the car away from edges. Next, orientation of road will be achieved through slopes of these edges.

Navigation & Destination!

Destination & current location has to be entered. We'll insert insti roads (Straight lines) info like road length & coordinates of major buildings of insti into it. Car would we able to choose shortest path from its current location to destination.

An odometer will be added to car which will keep track of distance covered by car, distance yet to be covered. This will be done in next 8 days.

Estimated Price

~ 7-8k