Autonomous Car

Mechanical Group

"Good design is obvious. **Great design is transparent.**" –Joe Sparano

About The Project

Autonomous Vehicle

CE-426

An initial version of the autonomous vehicle was done in summer of 2016. This is a new, modified plan using the Tiva C Series TM4C123G to interface with the sensors and motors to create an autonomous vehicle.

→ **To Be Completed By March 2017**

About The Vehicle

MINI Hatch Children's Electric Ride On

Big Toys Direct

Features:

- Licensed 12V Mini Cooper
- Remote Or Manual Operation
- 3 Speeds forward plus reverse
- MP3 Auxiliary Connection / Built in speaker
- Functional front lights
- Leather Seat with adjustable seat belt for ONE
- Perfect for children 2-4 years of age
- Weight capacity of 66 lbs
- SD Card and MP3 connectivity plus FM Radio
- Push-Button Start With Vrooom, Vrooom Start-Up Sounds
- Realistic plastic wheels with Traction Strips

The Team

Kevin Strauch

Team Leader

Andrew Brandt

Team Member

Trevor Montour

Team Member

Group Goals

- Assist in the creation of an autonomous children's ride on vehicle by providing hardware mounting, modification, and handling any other necessary mechanical aspects of the project.

- Apply good design practices and techniques to create a well designed finished product. No wires should be loose/out in the open if possible. Design should be rugged and secure. Design should be in the same style as the original vehicle – nothing looks out of place.

Fabrication of Mounts and Other Parts

- Mounts and other parts can be designed in CAD software and 3D Printed on a Monoprice Maker Select V2 3D printer, using PLA or ABS Plastic.

- Mounts can also be cut from acrylic, metal, wood, or other material for higher durability.

- Parts/mounts can be painted/printed in a matching color to keep up with the car's aesthetic look.

Fasteners

- Bolts/Nuts can be used to fasten mounts/parts to the vehicle.

- Self tapping screws could potentially be used to mount parts/sensor mounts to the body of the car.

- Super glue or other adhesives can be added to further secure parts/mounts.

- Loctite Threadlocker could potentially be used to secure nuts to increase ruggedness once the project is complete.

Cable Management

- Cables can be managed by drilling routing holes into the body and running cables through the inside.

- Zip ties and cable mounts can be applied to keep wires/cables from dangling freely, prevent tangling, and to help with organization

- Labels can be applied to wires so they can be identified while being mostly hidden within the body of the vehicle.

Current Plan of Action

Right now, we need to sit down with the sensor group and other groups to discuss what hardware will be used and where it needs to go. From there, we can design mounts/modify the vehicle as necessary on a case by case basis. So far, this is what we know we want to do.

1 Mount Computing Hardware Under the Hood

We want to mount the computing hardware safely and securely under the hood of the car. We also want to cut a new hood out of acrylic so you can view the hardware.

2 Take Advantage of Existing Places to Mount Sensors

In an effort to keep the aesthetics of the vehicle, we will be using things like the fake fog lights, the side view mirrors, and more to mount the sensors securely and seamlessly.

3 Position the Laptop in Place of the Seat

We decided to remove the seat and create an acrylic mount that screws in where the seat did to neatly and easily drop the laptop in and plug it in. This will make it easy to remove and replace the laptop while still ensuring that it is secure.

Conclusion

▪ Adding hardware to the vehicle should have a minimal impact on the aesthetics of the vehicle.

▪ Various methods can make the overall design more rugged so that there are no problems moving the vehicle or if it runs into objects.

Thank You

Any Questions?