Autonomous Vehicle Interior Design

Presentation by Team AVID
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Advisor: Mr. David Middleton

Project overview

- Focus: autonomous = self-driving vehicles
- Our plan: to investigate the design of autonomous vehicles and produce a full scale model!
- We will NOT be looking at the exterior
  - Design limitation
Specific demand for autonomous vehicles

- What is the demand for autonomous?
  - Information system development
  - Vehicle monitoring systems
- Applications with Uber, Lyft, etc.
  - Reduced travel time and transportation costs
  - Affordable autonomous taxi services
  - Less parking space needed
Brief history

- 1961: Stanford Cart
  - First self-driving vehicle
- 1977: Tsukuba Mechanical Vehicle,
  - First autonomous passenger vehicle
- 2015: Tesla autopilot
- 2015: University of Michigan Mcity
  - First world-class AV testing track

Importance of autonomous vehicles

- Increased safety
- Decreased traffic congestion
- Reduced emissions
- More free time
- Increase demand for skilled workers
- Lower fuel consumption
Tech consideration

- Smart glass integration
- Uses electrochromic technology
- Highly durable, not easily broken or brittle, maximum passenger safety

Safety regulations

- Federal Motor Vehicle Safety Standards (FMVSS)
  - NHTSA
- More guidelines than laws for autonomous
  - Keeping in mind not to hinder innovation
  - Redundant safety systems, cybersecurity, accessibility
Levels of automation

0: No Automation
Zero autonomy; the driver performs all driving tasks.

1: Driver Assistance
Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.

2: Partial Automation
Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.

3: Conditional Automation
Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.

4: High Automation
The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.

5: Full Automation
The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

Components

Current Car Packages
- Instrument Cluster
- Radio
- Bluetooth
- Navigation
- Maybe DVD

Future Car Packages
- Electronic Instrument Cluster
- Radio
- Bluetooth
- Navigation
- Collision Detection
- Autonomous Control
Possible Future Concerns

- Large-scale networking
- Networking for Autonomous Vehicles
- Safety concerns
- Seating and accessories must provide entertainment, communication, ease of access and organization
Survey

Questions will focus on:

- Age
- Gender
- Comfort
- Tech
- Space
- Driver control
- Health
- Safety
- Cleanliness

Automobiles of the future

- Develop the interior of a self driving car
- Consideration for both long distance commuting and short distance traveling
2017 Renault Symbioz concept

Symbioz demo car

- Functional prototype
- Level 4 autonomous driving
- Video playback of sensors and cameras
- Conventional seating that feels like sofa
Functioning demo of the Symbioz

https://www.youtube.com/watch?v=IsELVACr2VY

Autonomous Vehicle Interior Design

Autonomous Electric Vehicle Interior Design

Spring 2019

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<td>Define problem</td>
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Conclusion

- Strengthen and continue communication into the summer
- Develop more concepts using Design Thinking
- Anticipate tasks for next semester

References


THANKS!

Any questions?