Driverless Cars

Tyler Lindt
Brice Jackson
Pilar Mondragon
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Source: CNN Money/Autos
Howdy from Kitt

http://blog.fultonleasing.co.uk
No Hands!
Currently Offered Technology

- Current options lead to Automated Cars
- Electronic Stability Control (ESC)
- Adaptive Cruise Control
- Blind Spot Detection
- Lane Departure Warning
- Collision Mitigation

http://www.mbusa.com/mercedes/index
Google’s Contribution

- October 2010
- Software Decisionmaking
- Google Data Centers
- Two Drivers
- Stanford and Carnegie Mellon

http://translogic.aolautos.com
Google’s Contribution

- 140,000 Miles Driven
- 1,000 Miles of Trips without Intervention
- Knows the speed limit of Every Road
- Programmed Personalities
- 1 Accident
- 7 Cars

DARPA Grand Challenge

- **Goal:** Develop autonomous ground vehicles for military use.
- **Three separate challenges**
  - **2004** - 150 mile course. Best performance: 7.36 miles
  - **2005** - 132 mile course. Five finishers
  - **2007** - 60 mile urban challenge. Follow traffic rules.

http://www.liangfok.com/blog/?p=266
History

- 1977: Tsukuba Mechanical Engineering Lab (Japan).
- 1990s: Mercedes-Benz’s VaMP and Vita-2.
- 2010: Google car
SARTRE

- Safe Road Trains for the Environment.
- Platoon system: Train-like convoys.
- Improve fuel efficiency, reduce accidents, reduce journey times.

[2], 2011, “compare number plates” from http://blog.comparenumberplates.co.uk/tag/driverless-cars/
The Future

• We will need to wait between 10 and 20 years
• Expensive technology
• Lots of legislation
• SARTRE: Near approach

http://www.whitebunnywabbit.com/technology
Advantages

• Safety
  – Reduce number of crashes
  – Cut out human error

• Shipping of Goods
  – More efficient trucking industry
  – Economic Boost

• Reduced Energy Consumption
  – Lighter automobiles

• Road Capacity
  – Automobile Train
Issues

• Cost
• Accountability
  – Who is responsible for failure?
• Reliability
  – Defense against drunk drivers?
  – Computer dependability
• Job Loss
  – Trucking industry
• Automotive/Government Regulation
• Social Acceptance
Technology

- Novelty lies in car’s brain
- Sensors: camera, radar, & scanning 3-D laser
Google’s Sensors

- Video camera on windscreen detects traffic lights and moving traffic.
- Rotating sensor on roof generates 3D map of surroundings.
- Radar sensors - three at the front and one at the back - help determine position.
- Two people in car - driver to take over in an emergency, and engineer to monitor software.
References

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Don’t try this at home
Questions?