

GENERAL MOTORS COLLABORATIVE LABORATORY AT CARNEGIE MELLON

<http://gm.web.cmu.edu>



In 2000 General Motors Corporation established the collaborative lab at Carnegie Mellon to speed up research efforts on the next generation of vehicle information technology. The lab brought together experts from several different departments with the goal of creating a "smarter" car that would share a driver's workload and keep the driver's eyes on the road. In 2003, GM renewed their commitment to the university for an additional five years. More than 150 Carnegie Mellon engineering alumni now work in GM plants and labs worldwide.

Research at the Collaborative Lab focuses on four thrust areas:

- **Research in the Dependable Embedded Systems** area concentrates on improving automotive safety and reliability by adapting vehicle electronic configurations and functionality in situations in which the vehicle, the driver, or both are not operating at peak effectiveness.
- **Design Methodologies** are being developed that enable vehicle-level design, simulation, and validation of the computer system for the automobile of the future.
- **In the area of Human Computer Interaction** the goal is to improve security and driver-vehicle interfaces by building a car that is capable of analyzing the driver's intention and watching the physical and mental status of the driver for any impairments or information overload.
- **Wired and Wireless Multimedia** will enable the exchange of information between vehicles on the road, between vehicles and fixed network access points, and between vehicles and portable appliances within the vehicles, using wireless communications systems.

Smart Car

Researchers at Carnegie Mellon have built a prototype smart car that is both context aware and a companion that recognizes a driver's settings and keeps him alert. The car is responsive to the driver's needs and preferences, road and weather conditions, and can respond to information from the Internet on demand. Equipped with a gesture interface, the car's electronics can be controlled by a wave of the hand. A speech recognition system is tuned to the driver's voice and connects the car to a handheld computer and cell phone. A heads-up display lets the driver operate the radio, navigate, check email and his schedule. The car can automatically modify its own behavior, make "graceful upgrades" to new versions, monitor mechanical and electrical problems, and repair itself until you can get to the shop.

Demonstration videos of the Lab's prototype car are available on the website, <http://gm.web.cmu.edu/>.

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