

Discussion 6 Autonomous Vehicle Ethics

Discussion Topic:

1. Research

The advancement of artificial intelligence continues to increase and cause the proliferation of new products, such as autonomous vehicles. Begin by researching a car manufacturer and the state of its current autonomous vehicle technology. In this discussion, you will analyze the ethical considerations that should affect product development for a car manufacturer that is producing an autonomous vehicle.

2. Discuss

Please address the following points:

Identify ethical considerations that your chosen manufacturer should follow.

Identify any data that supports the ethical considerations that must be analyzed. Support your statements using peer-reviewed literature.

My Post:

Hello Class,

To consider the ethical implications of implementing autonomous vehicle technology. I chose to explore the current state of Mercedes-Benz's autonomous vehicle program. Mercedes-Benz offers a certified Society of Automotive Engineers (SAE) Level 3 (conditional automation) feature in its vehicles, called DRIVE PILOT (Mercedes-Benz, n.d.). Level 3 is a system that autonomously drives a car, but the human is still the fallback, creating a handoff driving risk. In other words, DRIVE PILOT allows drivers to take their hands off the steering wheel and eyes off the road. In the U.S., it is certified for use on most freeways in California and parts of Nevada, and the system is available when specific conditions are met, such as traffic speed (under 40mph), road type (approved freeways), environment & visibility (daylight hours, clear weather, and no construction), driver status (driver visible by the camera), and the car cannot change lanes or take an exit. In Europe, Mercedes is exploring expanding the system to higher speeds in Germany (Reuters, 2024).

Ethical considerations that Mercedes-Benz should follow include safety, transparency, and honest communication; clear ownership and accountability; privacy and data stewardship; and a commitment to fairness and social legitimacy.

This Level 3 automated system introduces risks that Mercedes-Benz should address by using safety-by-design principles, such as Conservative Operational Design Domain (ODD) boundaries, that is, defining when the system can and cannot drive. The driving control should be taken over with ease, and driver monitoring should be implemented, with clear fallback behavior if the driver does not respond. These technical implementations matter ethically as implementing predictable system actions and behaviors reduces the potential for harm.

Research by Nordhoff et al. (2023) on partially automated driving has shown that users can over-trust automation when they are not aware or do not fully understand the system limitations. Automated systems are complex and can be misunderstood by users and lead to misuse. This issue can be ethically

addressed by implementing transparency & honest communication through ethical marketing, naming, user manuals, and UI warnings to reduce overconfidence.

Who is responsible when something goes wrong? In complex systems, accountability and ownership should be distributed among multiple roles rather than resting on a single individual or group based on who has decision rights and control over the design, deployment, and operation of the system. In automated driving systems, responsibility should be shared across:

- Designers, who are responsible for the requirements and safety assumptions of the system.
- Developers, who are responsible for the implementation of the system.
- The testing and validations team, who are responsible for verifying that the system meets safety expectations.
- The drivers, who are responsible for being the fallback-ready user, remaining able to take over when the system malfunctions or requires it (expectation for SAE Level 3 operation).
- Regulators who are responsible for formulating setting approval or certification, including limits like roadway types, speed, and environmental constraints; and enforcing compliance and oversight (NHTSA, 2017).

Minimizing data collection and protecting what was collected are core principles of privacy and data stewardship. This means that Mercedes-Benz should treat autonomous driving data as a safety-critical asset and a privacy risk at the same time. It should only collect the data that is necessary to operate DRIVE PILOT safely. Only use the data for clearly stated purposes, protect whatever must be collected with security controls, and limit what is stored, shared, and retained after use.

Finally the system should not implicitly choose “whose safety matters.” It should implement the principles of fairness and social legitimacy. A series of surveys conducted by Bonnefon et al. (2016) found that most people endorse utilitarian autonomous-vehicle behavior in principle, that is, they approve of vehicles that would save the greatest number of lives in a crash scenario, but they often resist buying cars that might sacrifice their own occupants. This creates a social dilemma for Mercedes-Benz as the ethical option that maximizes overall safety may be unpopular with consumers. Additionally, research by Awad et al. (2018) found that cross-cultural moral preferences about who an autonomous vehicle should prioritize in a crash scenario (for example, sparing the young versus the old, or law-abiding pedestrians versus jaywalkers) vary significantly across societies. Applying this to Mercedes-Benz, the company should adopt an approach grounded in social legitimacy rather than treating ethics as a single, universal rule.

-Alex

References:

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