Automotive HMI: Current status and future challenges
Input to round table discussion

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Automotive HMI: Current status and future challenges

1. Major achievements in the last ten years

Driver assistance systems enter the market

- ESC is standard equipment for premium to compact cars
- Mass market for navigation and parking systems
- Safety & comfort systems introduced (ACC, LDW, ...)

Significant changes in HMI technology established

- Information is moving closer to the driver
- Input: Steering wheel control, touch screen, central control
- Output: Head-up display, central display, voice, etc

General understanding of DIS/DAS development

- European Statement of Principles, eSafety HMI group
- RESPONSE Code-of-Practice
- Stakeholder awareness by information campaigns

RESPONSE 3
a PReVENT Project

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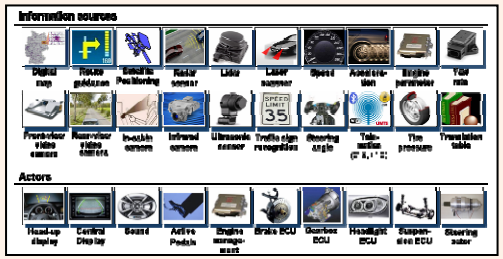
2. Major problems and challenges in next ten years

Integration of multiple assistance systems

- Multiple usage of sensors and actors
- Multiple usage of HMI input and output devices
- Architecture with scaling of functions



Driver distraction and overload

- Distraction as major accident cause (100-car study)
- Increased workload by non-driving related information
- Additional challenge with nomadic devices

Verification of safety and comfort improvement

- Safety requirements in a range of 10^{-6}/h
- High amount of driving tests
- Driver models not validated for safety proof

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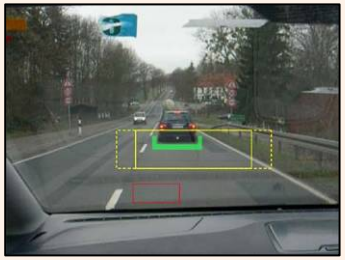
3./4. Most promising means and research needs

Understanding the driver

- Naturalistic driving studies for driver behavior, modeling
- Driver status and driver intention recognition
- For (semi-)autonomus driving: driver-vehicle cooperation

HMI technology improvements

- Natural language interaction
- Head-up displays with wider field of view
- … and more: gesture, finger writing, dual view displays



Management of HMI ressources

- Distraction issue can not be solved by HMI technology alone
- Integration of driving assistance, infotainment, telematics
- Requirements: scalability, flexibility, adaptability