

Automotive HMI: Current status and future challenges

AIDE final workshop and exhibition

April 15-16, 2008, Gothenburg

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

Dietrich Manstetten

Robert Bosch GmbH

Corporate Sector Research and Advance Engineering

Email: dietrich.manstetten@de.bosch.com

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1. Major achievements in the last ten years

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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



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2. Major problems and challenges in next ten years

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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

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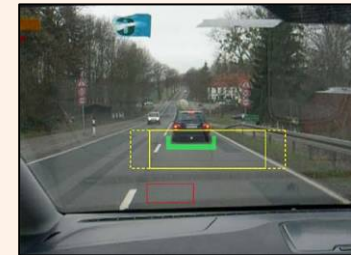
Understanding the driver

- Naturalistic driving studies for driver behavior, modeling
- Driver status and driver intention recognition
- For (semi-)autonomous 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 resources

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



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