AKTIV – experiencing the future together

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German research initiative AKTIV:

Adaptive and Cooperative Technologies for Intelligent Traffic
Development of assistance systems

- to increase traffic safety by
- reducing road traffic accidents,
- easing the driver’s load and
- improving safety for vulnerable road users
- based on robust perception of the driving environment
- and considering the driver and his awareness
• Duration 01.09.2006 – 31.08.2010

• Total Budget nearly 60 Mio. € (37 Mio. € for Active Safety)

• Funding about 27 Mio. € (15 Mio. € for Active Safety)

• Supported by the Federal Ministry of Economics and Technology

• Milestones presentation 25.06.2008 at BASt in Bergisch Gladbach
Active Safety Partners

- Audi
- BMW
- Daimler
- Ford
- Opel
- MAN
- VW

- Bosch
- Continental
- Ericsson
- Ibeo
- VDO-Automotive

- ifak Magdeburg
- Uni Hannover
- Uni Kassel
- TU München
- Hochschule Saarland

- Allianz
- DDG
- PTV
- Teleatlas
- TRANSVER
- Vodafone

- BASf
- Verkehrscentrale Hessen
Active Safety Project Structure

Active Hazard Braking

Intersection Assistance

Integrated Lateral Assistance

Driver Awareness and Safety

Pedestrian and Cyclist Safety
Key Findings of „100 Car Naturalistic Driving Study“
Concerning Driver Inattention  (Virginia Tech / NHTSA, 2006)

Facts:
- 241 drivers
- approx. 2.000.000 miles of driving
- 82 crashes / 761 near-crashes
- 8.295 incidents

Findings:
- involvement of driver inattention within 3 seconds to onset of conflict:
  nearly 80% of all crashes and 65% of all near-crashes
- driver drowsiness as a contributing factor:
  in 20% of all crashes and 16% of all near crashes

Consequences:
- detection of inattention allows for better warning and intervention systems
- reduction of inattention allows for reduction of crash risk
Horizontal project with the objectives of

**Monitoring driver awareness**
- by detection of driver behavior
- by detection of line of sight and position of head
- prototypic presentation and comparison

**Consideration of awareness for driver assistance systems**
- integration of driver awareness in warning and interfering concepts of the applications
- methods to enhance driver awareness

**Test methods in the process of development**
- test methods for usability & controllability for driving simulator and field
- development tools for testing sensor systems

**General conditions and consequences of use**
- long-term effects of assistance systems on traffic safety
- analysis of effects and benefits based on accident studies
- legal aspects regarding liability and introduction of assistance systems
Active Hazard Braking

Objective:
Collision avoidance and mitigation by *automatic hazard braking*
- adapted to the situation
- consideration of the driver awareness

Base:
- significant improvement of the detection accuracy
- adaption of the system interaction to the driving situation
- verification of the system decision by perception driver reaction

Improvement:
- system performance superior to existing emergency brakes
- risk of a wrong system decision will be significantly reduced
Objective:

*Continuous lateral guidance*

in the full speed range from 0 to 150 km/h

- during lane keeping in straights and curves
- by taking into account objects in the driving environment
- with high availability also in congested traffic and within construction zones

Base:

Detection of driving environment with high performance front oriented sensors as well as integration of high-precision digital maps and positioning
Objective:
Enhancement of safety at intersections by avoiding driver failures and critical manoeuvres

Support of the driver
• during turning and entering
• while crossing the intersection
• to keep the adequate distance to the preceding vehicle

Base:
• onboard sensing systems (radar, lidar, camera)
• cooperative sensors such as V2V communication
• integration of positioning and digital maps
• comprehensive situation analysis
Objective:
Enhancement of safety for vulnerable road users

Development of active means for protection:
• driver warning (acoustic, optic and tactile)
• warning the environment (horn)
• active intervention in braking and steering
• active protection mechanisms (tilting hoods)

Big challenge for sensor systems (video, lidar, radar)
• high diversity of appearance in complex traffic environment
• high processing speed and robust environment detection
• adaptive situation analysis

Development of strategies to avoid accidents and to soften impacts.
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