PRESS RELEASE

INVENT Halftime presentation in Bonn, June 26, 2003

Stress-free driving for tomorrow

Research Initiative INVENT presented visionary solutions for future driving assistance systems, active safety, and efficient traffic management

Wouldn't you like to receive advance warning when you are approaching a traffic jam? How about an individually optimized alternative route? Imagine that your car monitors its environment, warning you in time if a child runs unexpectedly into the street. The research initiative INVENT (intelligent traffic and user-oriented technology) is advancing the development of intelligent vehicle systems that will provide the required information and alert drivers to hazardous situations. On June 26, 2003, on the premises of the Federal Ministry for Research and Education, the research initiative presented the results of its work up to now. The halftime report of the 4-year research program comprises various pilot applications and analyses designed to make future traffic safer and more efficient for all stakeholders. The Federal Ministry for Research and Education is supporting the research cooperation of 23 partners in INVENT. The research initiative focuses on three main themes: „Driver Assistance and Active safety“, „Traffic Management 2010“ and „Traffic Management in Transport and Logistics“. The concepts and solution approaches of the individual projects have been shown in Bonn using computer and poster presentations as well as several demonstrator vehicles.

The present state of affairs is alarming

In a study, the German automobile club ADAC has estimated losses due to traffic congestion at 33 million liters of wasted fuel, 13 million hours of wasted time, and 250 million € of economic costs – *daily*. Congestion is frequently caused by accidents. At present, about nine in ten accidents result from human error. However, many of these could be prevented using modern driver assistance systems. The results of the

research initiative INVENT will help to realize this potential for savings to the greatest extent possible.

Driver assistance systems offer new opportunities

The focus of the presentations was the project group “Driver Assistance and Active Safety.” Its goal is to decrease the burden on the driver in traffic by means of innovations such as „Anticipatory Active Safety” and the “Congestion Assistant.“ The potential of these systems for active support of the driver in the driving task leads to novel issues in their assessment. For this reason, a special team has been created to investigate the impacts of such systems on all aspects of traffic flow and to analyze traffic, regulatory, liability, and customer acceptance issues. For example, research in „Anticipatory Active Safety “ has led to a vehicle that is capable of correctly recognizing and interpreting traffic signs and signals. During the demonstration in the plaza of the ministry, the vehicle approached a stop sign and brake to a stop without action by the driver. However, future assistance systems are designed not to replace the driver, but rather to support the driver or decrease the burden on him, especially in critical situations. Hence, in this example the system could react in stages, beginning with simple data transfer and warning messages and escalating to automatic emergency intervention. However, this active option is designed as a last resort in case of imminent collision.

Numerous driver assistance applications

In the future, anticipatory driver assistance systems will offer even more: For example, turning, entering, crossing, and obstacle avoidance assistance systems will inform the driver about oncoming traffic, pedestrians, and obstacles encountered during critical maneuvers. In an emergency, the systems will have the technical capability to intervene as appropriate in power train control, braking, and steering. To this end, driver assistance systems will receive and combine information originating from multiple data sources, such as cameras, infra-rot-sensors, lasers, radar, geographical data bases & digital maps, GPS data – and even the exchange of data between different vehicles. The INVENT experts have demonstrated these innovations in vehicles equipped with an extensive array of sensors. For example a movable camera system has been demonstrated that is capable of detecting and

monitoring traffic signals mounted above the street. In another experimental vehicle, reconstruction of the entire environment surrounding a vehicle has been demonstrated using sensor fusion of individual sensors. This reconstruction will create a basis for providing appropriate information to the driver and will enable active safety interventions.

Appropriate lane changing

Another project is investigating lane-changing behavior and possible processes for optimizing lane changes for better traffic flow. Future systems will avoid needless lane changes and recommend modifications of driving strategy that are anticipatory. The research of the INVENT experts has shown that inappropriate lane changing impedes traffic flow and exacerbates traffic congestion, especially on highways. Indeed, one of the aims of INVENT is to smooth traffic by decreasing "stop-and-go" waves on highways and thus to increase capacity flow.

Optimized routing support

In the future, improved telematics and navigation services will help drivers to avoid entering congested traffic in the first place. To this end, the INVENT researchers are developing dynamic systems taking into account multiple criteria to select a personalized route appropriate for the driver at the current moment. The individualized route recommendation could take into account, for example, short-term events such as a city marathon or a political rally, as well as delays caused by detours, traffic jams, or a defective traffic signal. Conventional traffic information is not capable of providing these services, which require an intelligent, sophisticated knowledge basis. Future systems will access not only current traffic information, but will also perform a traffic forecast for the entire route and take this into account along with public traffic management policy and priorities. Consequently, while by-passing traffic jams, drivers will not inadvertently end up on residential streets. Within this process, the car serves not only as a receiver and processor of relevant traffic data, but also actively supports the traffic knowledge basis as a "probe vehicle" by data acquisition and transmission to a traffic management center.

INVENT is concerned with all stakeholders in traffic, while aiming to make every trip safer and roadway system usage more efficient. In our service-oriented economy,

customer requirements and the challenges they pose to transport and logistic companies have grown enormously. Meeting these challenges is the goal of one INVENT project "Traffic Management in Transport and Logistics", in which new logistic concepts and recipient-operated delivery services are being developed using novel information and communication technologies.

INVENT

INVENT (Intelligent traffic and user-oriented technology) is a research initiative with the goal of making future traffic safer and more efficient. To this end, the partners are cooperating in the development of novel driver assistance systems, knowledge and information technologies, and solutions for efficient traffic management. The four-year research initiative will continue until 2005 and is supported by grants from the Federal Ministry for Research and Education (BMBF). The 23 research partners of the initiative include Audi, BMW, Bosch, DaimlerChrysler Research and Technology, the German Aerospace Agency (DLR), Ericsson, the Aachen Vehicle Research Institute (fka), Ford, Hella, Hermes Parcel Service, IBM, the Magdeburg Institute for Automation and Communication (ifak), MAN Commercial Vehicles, Navigation Technologies, Opel, PTV, Siemens AG, Siemens Restraint Systems, Siemens VDO, TransVer Traffic Consultancy of Munich, the German Standards Group (TÜV), the University of Cologne, and Volkswagen. Numerous university institutes as well as small to medium-sized companies are also contributing to the projects as subcontractors. Continuity of research in traffic, transport and traffic safety also aims to strengthen the competitiveness of German industry. Further information is available under www.invent-online.de.

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