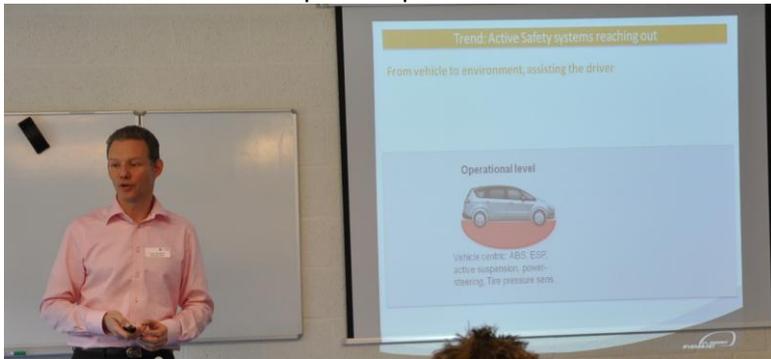


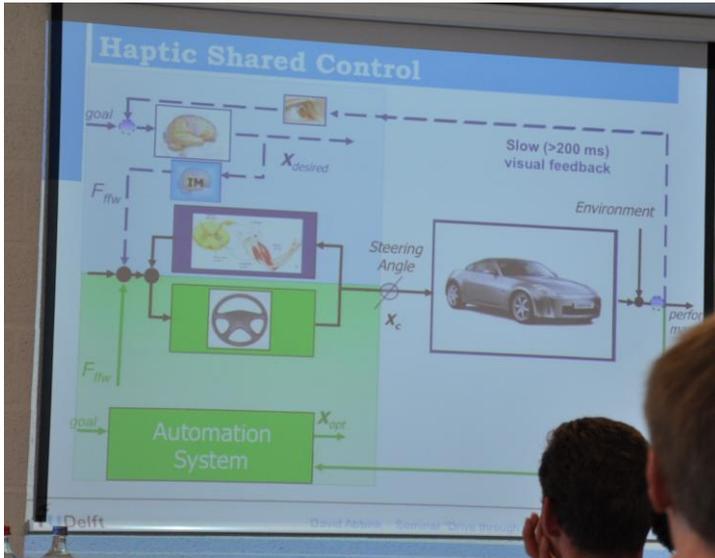
SUMMARY TECHNOLOGY SEMINAR “DRIVE THROUGH YOUR SENSES” - 8TH MAY 2012

On this warm and cloudy afternoon of May the 8th, in the green woodenly surroundings of the Leuven.INC’s headquarters, the seminar “Drive through your senses”, organised by VeroTech and LeuvenInc, unveiled the advances in driver comfort and safety for the car of tomorrow. Cars are rapidly becoming smarter and more autonomous, we are thus at a critical point where the border between automation and human control has to be determined in order to thrive in safety and comfort of driving.

The scene was set with an interesting positioning presentation from André Nieuwland representing Flanders Drive. He described the evolution in car safety design all the way from 1865. He made an anecdote referring to an old English law of 1865 where cars needed to be preceded by a man walking with a red flag to warn the arrival of the vehicle. From there on, the concern about safety evolved in automotive as this wasn’t feasible for very long due to the increase of speed in motor vehicle. Nevertheless, the “red-flag act” is now coming back in the form of pedestrian detection systems which would either warn them or break the vehicle automatically to avoid an accident. The link to comfort was also emphasised by showing that safety systems were usually linked to increased comfort, such as navigation based warning systems, reversing sensors, camera and radar systems such as lane-assistance up to adaptive- or even autonomous cruise-control.



The keynote was then followed by a presentation on Haptic Shared Control for automotive application. Currently, more and more research is being done to develop fully autonomous cars which could drive on today’s road without any modification of the infrastructure. David Abbink, PhD at the TU Delft, showed us the danger of going towards too much automation and how this can be solved using haptic shared control. The idea behind it is to leave the human as the interface which closes the loop between what the car is doing at certain point and what it should be doing to keep it on the road. Haptic means the sense of touch, in this case a force would be used as feedback (input) to the driver rather than just visual feedback that drivers currently use. The reason is that the reaction time from a muscle input to a muscle action (driving/steering) is much quicker than from a visual input to a muscle action. This way a car’s driving assistance systems will be able to detect what the best steering angle should be and help the driver reach that point by giving input to the driver directly on the steering wheel rather than taking over control or just giving a warning.



From haptics we moved on to a presentation by Joris Roels from the company Melexis about sensors and electronics in the cars. As the shift towards more autonomous systems is happening, the importance, diversity and complexity of electronics is growing in order to make safer and more comfortable cars. He stated the problem of bandwidth in cars, as systems are becoming more complex, the amount of sensors and data transfer is increasing. He demonstrated how it can be addressed: by smart component design and multiple sensor integration, also called sensor fusion, is needed to cope with the increasing number of system that are being added to every car.

After a short coffee break, we were guided through the presentation lead by Prof. Daniel Berckmans from the K.U. Leuven about individual monitoring (being either animals or humans) and how it can be applied into cars to monitor driver's sleepiness level. He emphasised the fact that it was important that in such applications, no false positives should ever be detected. This is due to the fact that people will usually quickly lose trust in a system which warns you about something that they believe is not or will not happen. It was also importantly stated how the technology they are developing is very different from all others because the algorithm are measuring and modelling the individuals in real time and the model is continuously being modified to understand the individual monitored at that moment. Most similar system will use generic models of human drowsiness using statistics on average populations and not building the model in real time. It is important to note that their algorithms don't need much computing power but good data acquisition about the individual which is being monitored.

The final presentation was given by Konstantinos Gkagkas from Toyota Motor Europe who gave us an insight on the car of the future from a car manufacturer's perspective. He told us how it was important for Toyota to keep the passion of driving alive in the cars for tomorrow. Toyota's envisioned target is to go towards an automotive world with Zero-Emissions and Zero-Accidents. This therefore supports the theme of the seminar where the passion for driving has to be kept alive by keeping drivers happy and at the same time developing systems which will make car safer, more efficient and still fun and enjoyable to drive with.



The seminar was concluded by a panel discussion where VeroTech Consultant and Moderator for this event, Toon Leroy, first asked all the speakers to comment on the vision of the future of 2010 as seen from the 1960's where everyone would have by then fully automated cars which would drive everyone to their destination in a guaranteed safe way at speeds over 200km/h. The discussion was then open to the public and lasted for nearly 45 minutes about how people envision the transition towards more autonomous driving. The debate often referred to the aviation industry where most systems are now being automated and where we see that the problems nearly always lies at the interface between the human and the autonomous system. The core question therefore lies around the problem of who to trust in critical situation and we can therefore say that the debate is certainly not closed on how the road towards more autonomous systems should be laid out.

