

"Are automated vehicles allowed to be unsafe in their decisions?"

*Statement by Ass.Prof. Dr. Cornelia Lex
on the basis of the given, concrete questions for the event
"In Focus: The Ethical Challenges of Automated Driving"*

Imagine the following situation from the point of view of a driver: You are on the motorway and in front of you is a much slower vehicle or even a vehicle that has stopped at the lane. What options do you have to react and prevent a collision?

In this situation you have two options: Avoid or brake. Which of the two options is optimal in terms of accident prevention depends on several factors: Is an alternative lane free and does not a faster car come from behind? What is the relative speed between my vehicle and the obstacle? What is the road condition (e.g. dry / slippery) and the brake and steering forces that can be transmitted with it? How is the obstacle arranged within the lane (further right or further left in the lane)?

For this relatively simple scenario with only two decision options, some boundary conditions must already be taken into account. All these factors are also perceived less or more consciously by human drivers in driving situations and included in the decision. Usually optical impressions are used (e.g. "Is the left lane clear?"), but feedback from the steering wheel and driving behaviour is also taken into account (e.g. "Is the road below me slippery?"). Like human drivers, vehicles also have to measure these conditions or estimate them from other indicators such as vehicle response and optical stimuli. It cannot be assumed that every condition can be determined with a probability of 100 %. Uncertainties in detection and time delays must be taken into account in driving strategies.

In my research focus I am concerned with the identification of vehicle and environmental conditions, which are needed on the one hand as support for human drivers and on the other hand for automated driving. One of the most important conditions here is the road condition, to which the driving style must be adapted for legal reasons. How exactly the road condition can be determined depends very much on how the vehicle is currently being moved. For example, some conditions can be determined more precisely when braking is in progress. In order to be able to determine very precise values in all driving situations, additional sensors may have to be integrated. The question of which estimated values are accurate enough cannot always be answered unequivocally. In most cases, even the developers of the driving functions themselves cannot answer this question. Very often the question is how great the risk is if an inaccurate value is used in a driving strategy.

Automated driving functions will not be allowed to make more mistakes than human drivers. Otherwise it will be assumed that these vehicles will not be accepted by society. "No more mistakes" also means that accidents will have fewer consequences, i.e. less damage to property and less risk of injury than human drivers. Where experts are not sure, it is sufficient if automated driving is only slightly better than human driving, or if a significant improvement is needed. This is particularly relevant in the first phases of automated driving, where the functions are not yet so mature. In this phase, public attention will also be high. One scenario is that serious accidents involving automated vehicles will become the focus of public attention. This prevents traditional vehicle manufacturers in particular from taking risks in vehicle development. Another scenario is that the social focus is dominated by advantages, such as Comfort and time savings in daily journeys. Initial starting difficulties in automated driving are assessed more playfully in the first phases and are accepted as a learning phase, just as with student drivers.

The following questions are derived from this: - How much risk can an automated vehicle take if not all the information describing its surroundings and its own condition is 100% secure? Is it acceptable

if pure material damage is accepted up to a certain limit? How safe can the risk of injury be determined a priori?

Automated vehicles will only be accepted if they make fewer mistakes than humans. That they don't make any mistakes at all and will always assess every situation 100 % perfectly

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Bibliographic data:



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