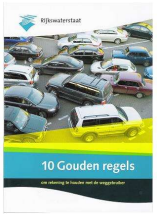

Mens - Voertuig - Gedrag
over voertuigbestuurders, geautomatiseerde voertuigen en de interactie
dr. Ilse Harms
@ilseharms


THE ATTENTION TEST
@ilseharms
14 oktober 2022
2

WAAROM?

Individuele verschillen: DE weggebruiker bestaat niet



Waarnemen


Bron: Hooge (Universiteit Utrecht)

Alleen waar we direct naar kijken zien we scherp

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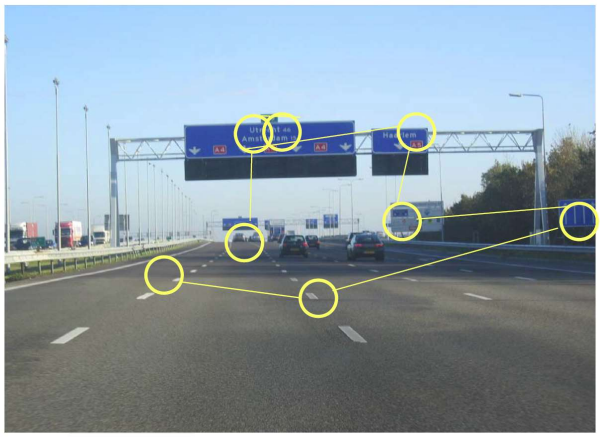
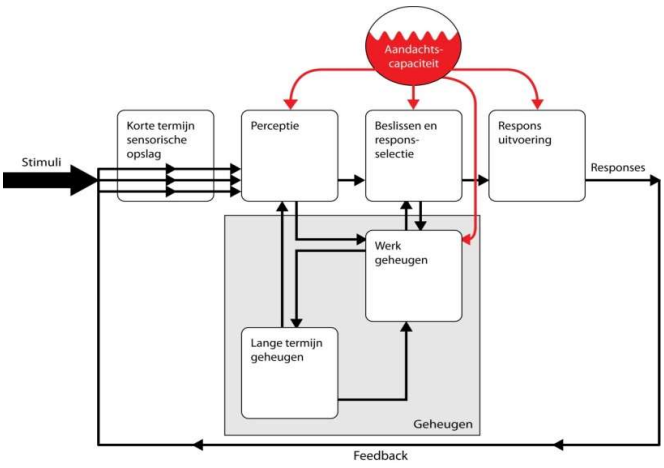


Bron: Theeuwes (Vrije Universiteit Amsterdam)

Tijdens fixatie wordt de informatie verwerkt

Begrijpen

Informatie verwerken doe je zo



Bron: Wickens & Holland (2000)

De boodschap moet bekend zijn

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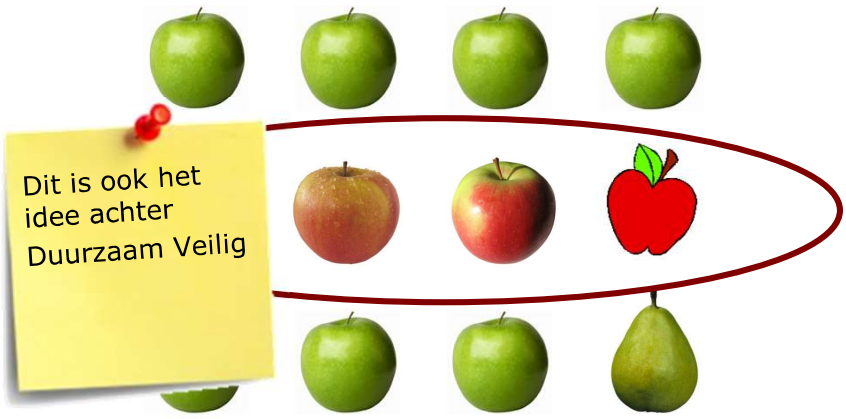
Informatieverwerking eenvoudiger bij uniformiteit



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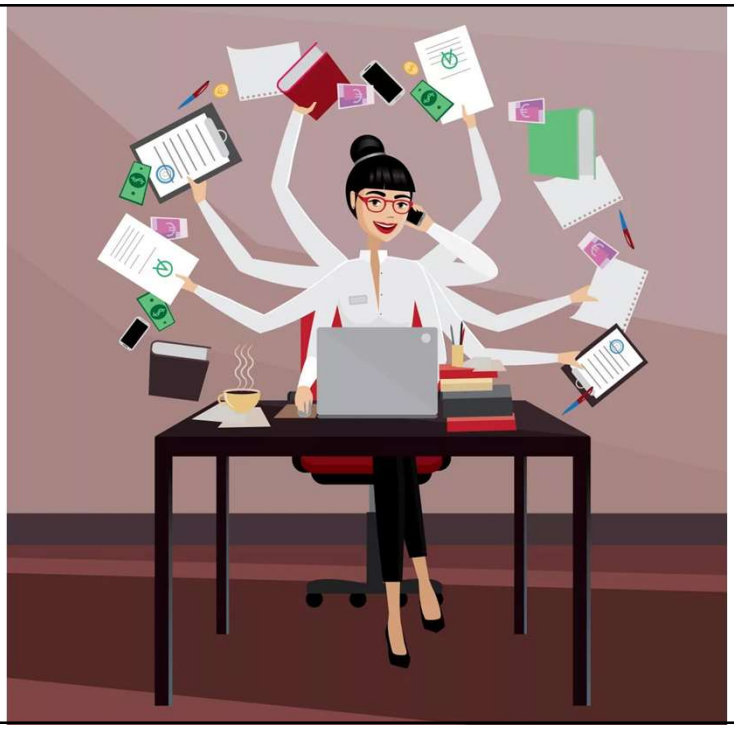
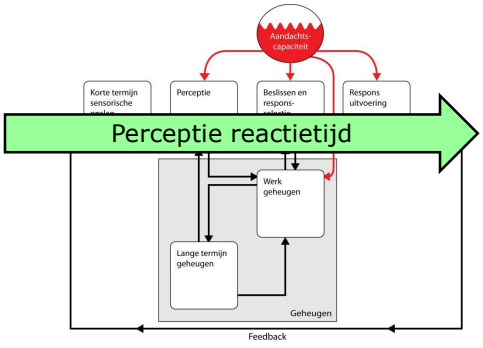
Kunnen



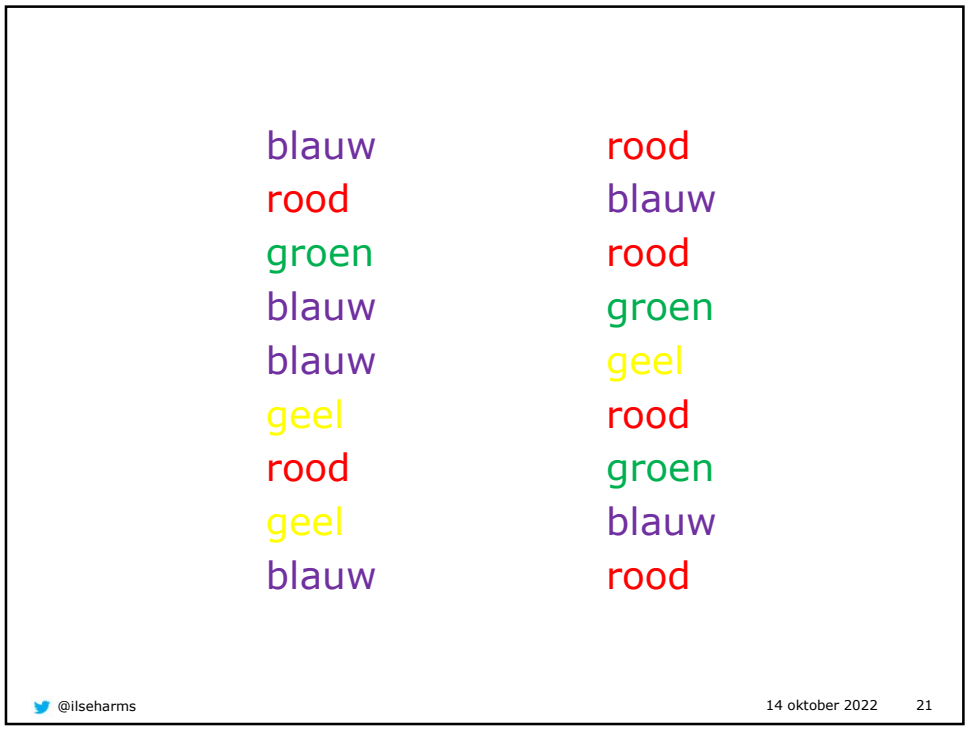
Biep, biep,… Nieuw bericht… Op de rotonde rechtsaf…

In het verkeer is niet altijd evenveel *aandacht* nodig, maar wel *tijd* om informatie te verwerken

Om te remmen
Perceptie reactietijd voor de gemiddelde bestuurder ligt tussen de 1 en 2 sec



Bron: Wickens & Holland (2000)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Willen

Doelgericht gedrag

- 3 typen doelen:
  - normatieve doelen (je gepast gedragen, o.a. vriendelijkheid, behulpzaamheid)
  - hedonistische doelen (je beter voelen in het hier en nu, o.a. plezier hebben, uitrusten)
  - winstdoelen (beschermen en verbeteren van bronnen, o.a. geld verdienen, winnen)

(Lindenberg & Steg, 2007)

Normoverschrijdend gedrag leidt tot nieuwe sociale norm

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Imitatie en spookfile app

Human error

Human error: maar wiens fout is het eigenlijk?

Wie moet wat doen zodat slimme en groene mobiliteit ook veilig is?

"You weren't listening.
I said, 'DON'T fall.'"

VOERTUIG

90%

of accidents are caused by human error

NHTSA rapport door Treat et al. (1977)

"Human errors were involved at the probable level in more than

90%

of the accidents, but were the sole reason for accidents in only

57%

of the cases".

Full report: https://rosap.ntl.bts.gov/view/dot/25794/dot_25794_DS1.pdf

De meest voorkomende 'human errors' (Treat et al. (1977)

1) Herkenning (niet goed gekeken, te hard rijden, onoplettendheid)

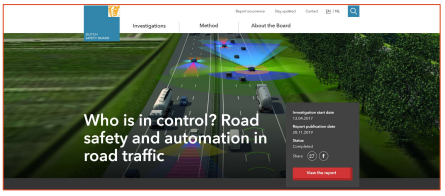
2) Beslissingsfouten

Is automatisering superieur over mensen, op al deze punten, in alle situaties?

"A common characteristic of most accidents is that they result from multiple "causes" rather than a single one."

(Treat et al. (1977)

- Bij het autorijden ben je onderdeel van een complex system
- Met de introductie van 'automatisering' in dat system, introduceer je ook meer oorzaken



Geassisteerd rijden versus geautomatiseerd rijden: rijvaardigheid

Gevaarherkenning

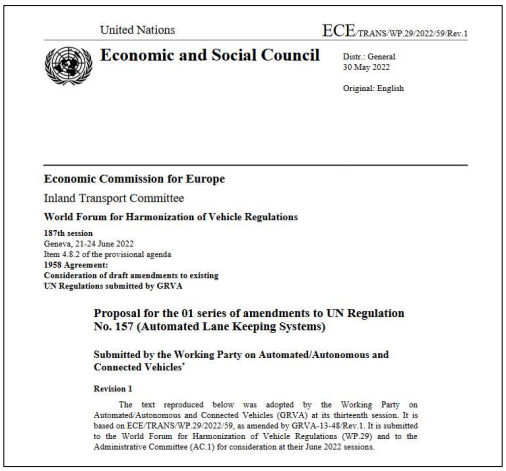
Gevaarherkenning

Over de grens

- Expliciete en impliciete verkeersregels
- Voorspelbaarheid
- Beoordelen van gepast rijgedrag

Een grote uitdaging is de beoordeling van geautomatiseerde voertuigen

Open normen en beperkt ODD, bijv. ALKS R-157



United Nations ECE/TRANS/WP.29/2022/59/Rev.1

Economic and Social Council

Distr.: General
30 May 2022

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

187th session
Geneva, 21-24 June 2022
Item 4.8.2 of the provisional agenda
1958 Agreement:
Consideration of draft amendments to existing
UN Regulations submitted by GRVA

Proposal for the 01 series of amendments to UN Regulation No. 157 (Automated Lane Keeping Systems)

Submitted by the Working Party on Automated/Autonomous and Connected Vehicles'

Revision 1

The text reproduced below was adopted by the Working Party on Automated/Autonomous and Connected Vehicles (GRVA) at its thirteenth session. It is based on ECE/TRANS/WP.29/2022/59, as amended by GRVA-13-48/Rev.1. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their June 2022 sessions.

Open normen en beperkt ODD, bijv. ALKS R-157

Introduction

The intention of the Regulation is to establish uniform provisions concerning the approval of vehicles with regard to Automated Lane Keeping Systems (ALKS).

ALKS controls the lateral and longitudinal movement of the vehicle for extended periods without further driver command. ALKS is a system whereby the activated system is in primary control of the vehicle.

This Regulation is the first regulatory step for an automated driving system (as defined in ECE/TRANS/WP.29/1140) in traffic and it therefore provides innovative provisions aimed at addressing the complexity related to the evaluation of the system safety. It contains administrative provisions suitable for type approval, technical requirements, audit and reporting provisions and testing provisions.

ALKS can be activated under certain conditions on roads where pedestrians and cyclists are prohibited and which, by design, are equipped with a physical separation that divides the traffic moving in opposite directions and prevent traffic from cutting across the path of the vehicle. In a first step, the original text of this Regulation limits the operational speed to 60 km/h maximum.

This Regulation includes general requirements regarding the system safety and the failsafe response. When the ALKS is activated, it shall perform the driving task instead of the driver, i.e. manage all situations including failures, and shall not endanger the safety of the vehicle occupants or any other road users. There is however always the possibility for the driver to override the system, at any time.

The Regulation also lays down requirements on how the driving task shall be safely handed over from the ALKS to the driver including the capability for the system to come to a stop in case the driver does not reply appropriately.

Open normen en beperkt ODD, bijv. ALKS R-157

6. Human Machine Interface/operator information

The fulfilment of the provisions of this paragraph shall be demonstrated by the manufacturer to the technical service during the inspection of the safety approach as part of the assessment to Annex 4 and according to the relevant tests in Annex 5 and Annex 6.

6.1. Driver Availability Recognition System

6.1.1. The system shall comprise a driver availability recognition system.

The driver availability recognition system shall detect if the driver is present in a driving position, if the safety belt of the driver is fastened and if the driver is available to take over the driving task.

6.1.2 Driver presence

A transition demand shall be initiated according to paragraph 5.4. if any of the following conditions is met:

(a) When the driver is detected not to be in the seat for a period of more than one second; or

(b) When the driver's safety belt is unbuckled.

The second level warning of the safety-belt reminder according to UN-R16 may be used instead of an acoustic warning of the Transition Demand.

6.1.3. Driver availability

The system shall detect if the driver is available and in an appropriate driving position to respond to a transition demand by monitoring the driver.

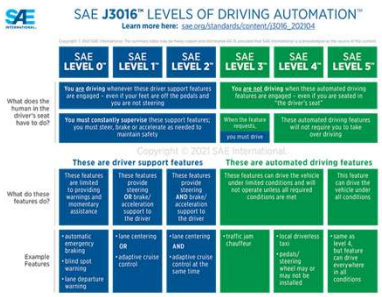
The manufacturer shall demonstrate to the satisfaction of the technical service the vehicle's capability to detect that the driver is available to take over the driving task.

Welke organisaties/ partijen heb je nodig voor typegoedkeuring van een ALKS?

En wat moet je regelen als Nederland?

Voertuigautomatisering vraagt om een nieuwe beoordelingsaanpak

SAE levels van voertuigautomatisering (2021)



Euro NCAP aanpak

assisted driving

automated driving

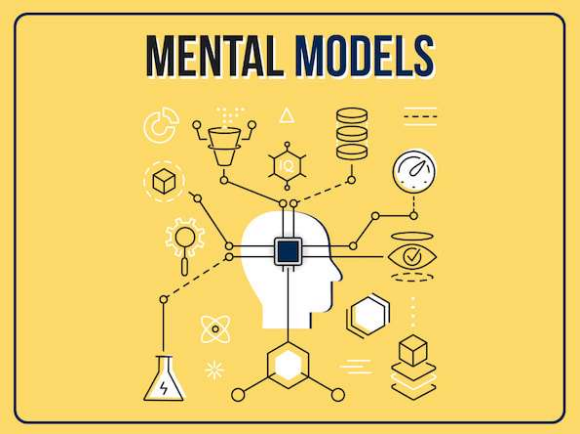
autonomous driving

Met toenemende voertuigautomatisering is ook de binnenkant van het voertuig veranderd

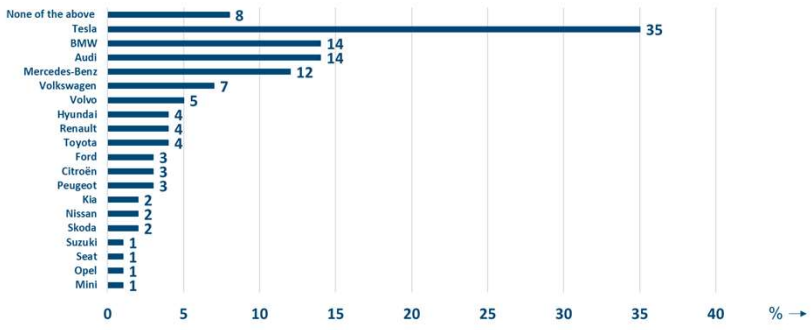
Met toenemende voertuigautomatisering is ook de binnenkant van het voertuig veranderd

INTERACTIE

Al vóór het instappen…

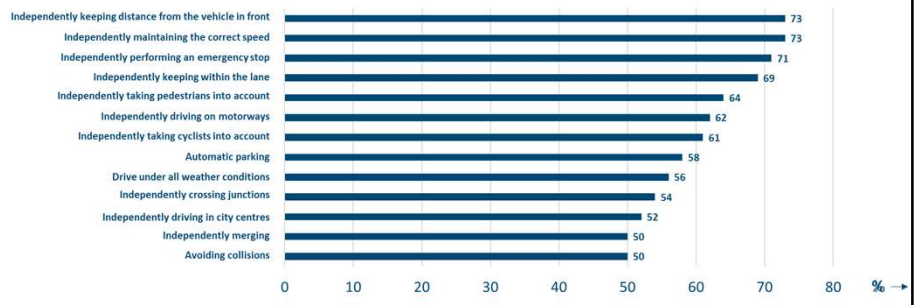


Which brand(s) do you believe currently have a self-driving car for sale to consumers?



Harms, I.M., Teuchies, M., Boudry, E., Van den Berghe, W. (2021). Framing Automation of Driving Tasks: Effects on Risk Perception and Consumers' Current Understanding of Different Levels of Vehicle Automation across Four European Countries. *Proceedings of the 7th Humanist Conference*, Rhodes Island, Greece, 26-27 October 2021.

In your opinion, what must a car be able to do for it to be defined as self-driving?



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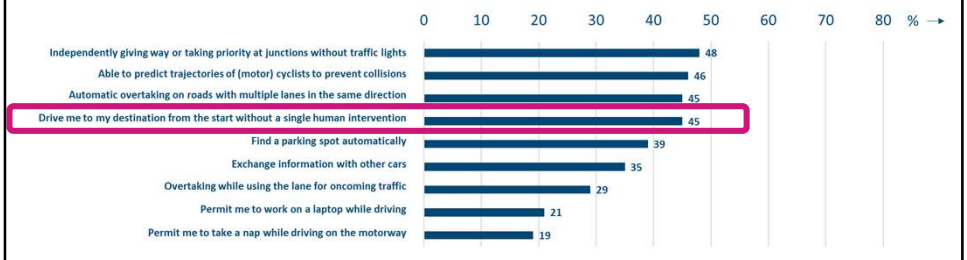

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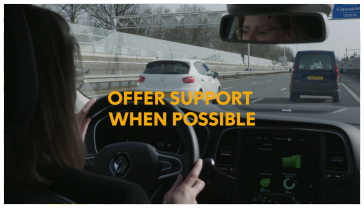
An experiment…

Comfort

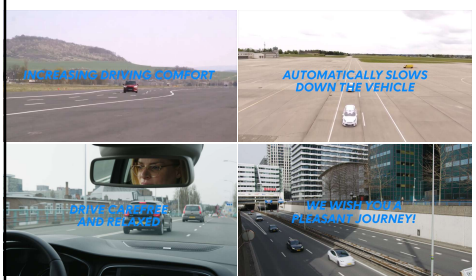
Responsible



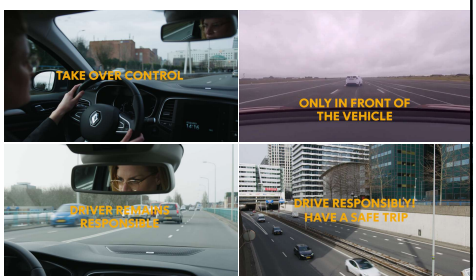
- Compared: video condition (ADAS) – definition semi automated driving (AD) – definition fully AD
- Questions on risk perception, derived from Singer and Jenness (2020)

The comparison for assisted driving mode

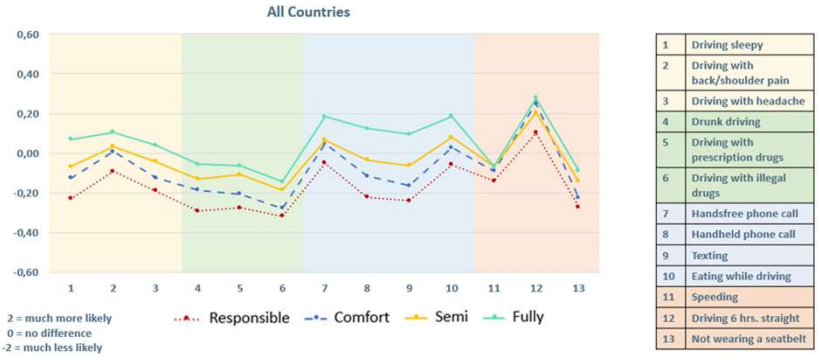
Comfort



Responsible



Risk appetite for the car in the video clip (2 conditions), semi-automated and fully automated cars



1	Driving sleepy
2	Driving with back/shoulder pain
3	Driving with headache
4	Drunk driving
5	Driving with prescription drugs
6	Driving with illegal drugs
7	Handsfree phone call
8	Handheld phone call
9	Texting
10	Eating while driving
11	Speeding
12	Driving 6 hrs. straight
13	Not wearing a seatbelt

Harms, I.M., Teuchies, M., Boudry, E., Van den Berghe, W. (2021). Framing Automation of Driving Tasks: Effects on Risk Perception and Consumers' Current Understanding of Different Levels of Vehicle Automation across Four European Countries. *Proceedings of the 7th Humanist Conference*, Rhodes Island, Greece, 26-27 October 2021.

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Trust calibration: is het perfecte systeem écht perfect?

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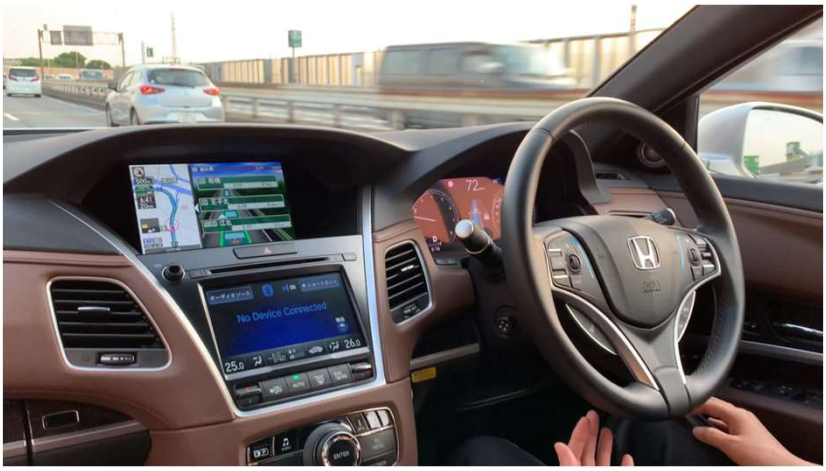
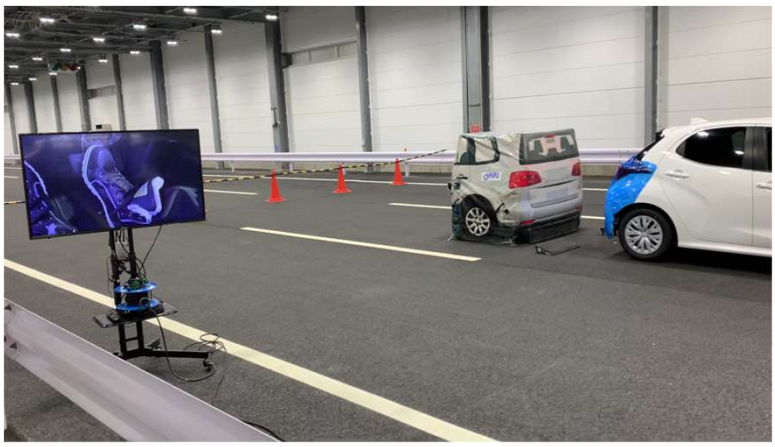
Trust calibration: L2+



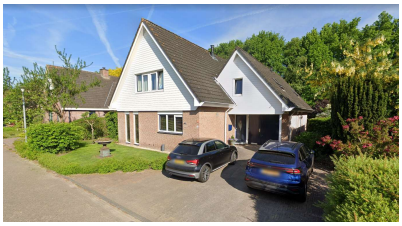
Transition of control (ToC)

Mode confusion binnen het voertuig



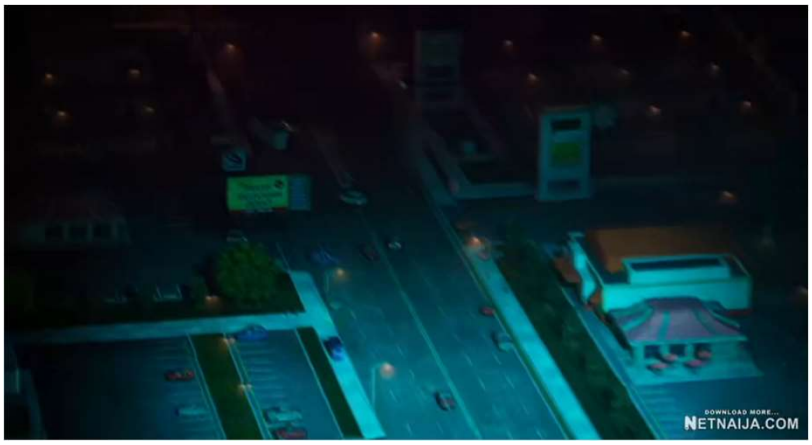
Mode confusion: binnen 1 voertuig, maar ook tussen voertuigmerken

- In 2020 is het gemiddeld aantal auto's per huishouden in Europa 1,3



Imitatie: lead by example

Uittesten en provoceren van de nieuwe weggebruiker



Euro NCAP HMI and HF WG

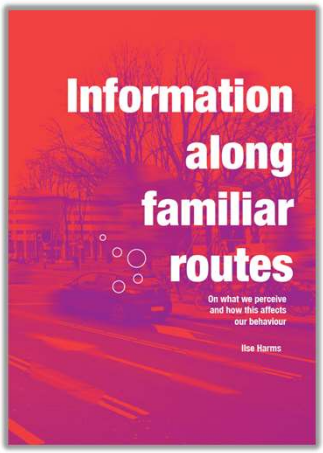
EURO NCAP · RDW · TNO kass · Thatcham Research · Unfallforschung der Versicherer GDV · bast · TRAFIKVERKET · The Government of the Grand Duchy of Luxembourg Ministry of the Economy · Applus IDIADA · UTAC · ADAC · CSI

Euro NCAP Roadmap: OEMS consultation

The ultimate level of standardisation: single device vehicle activation

Steeri

Link naar mijn proefschrift



DeVerkeersGedragDag

www.devgd.nl
Jaarlijks 1e woensdag van april

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