Driver-centered Human-machine interface design

## for a better takeover experience in level 4 automated driving

1. During automated driving
While automated driving, driver is conducting secondary tasks, information is provided on the HUD, requiring driver's voluntary attention. HUD provides transparent information on what the automation is doing, thinking and intend to do / next moves clearly.

2. During automated driving (Wakeup call)
Driver is playing mobile phone and two minutes before takeover, wake up notification is communicated with the driver through two main ways: 1. Provide alert to where the attention is (notification on the phone); 2. Ambient light signals: use breathing light to wake up driver from ST.

3. During automated driving (Step by step guide)
A three step guidance (Figure 41) is given to drivers to support them get prepared and ultimately become fit for takeover.
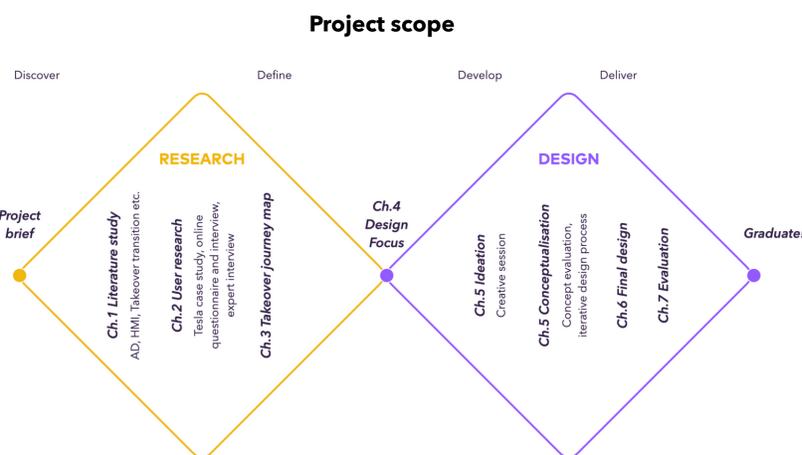
4. Takeover request
After driver gets prepared, the takeover request follows up seamlessly. The takeover request is given with multi-modal notification at the same time: visual (blinking and gradient light signal, universal takeover message on the HUD), auditory(takeover warning sound).
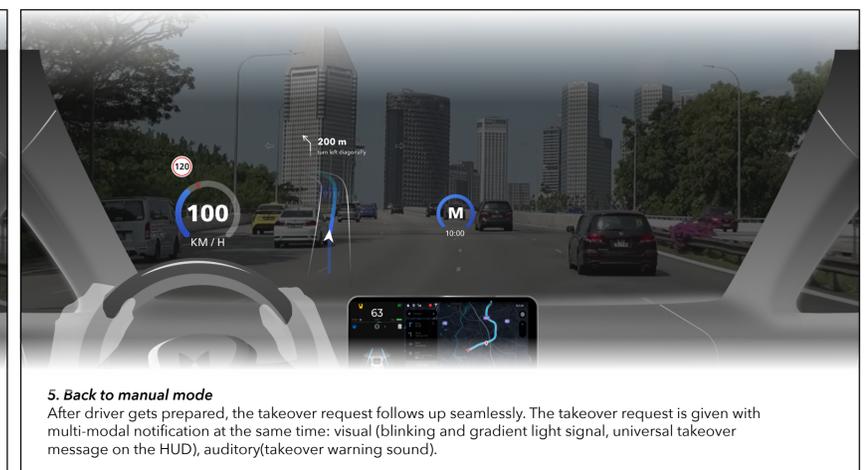
5. Back to manual mode
After driver gets prepared, the takeover request follows up seamlessly. The takeover request is given with multi-modal notification at the same time: visual (blinking and gradient light signal, universal takeover message on the HUD), auditory(takeover warning sound).

Project scope

Discover — Define — Develop — Deliver

RESEARCH

Project brief

Ch.1 Literature study — AD, HMI, Takeover transition etc.
Ch.2 User research — Tesla case study, online questionnaire and interview, expert interview
Ch.3 Takeover journey map

Ch.4 Design Focus

DESIGN

Ch.5 Ideation — Creative session
Ch.5 Conceptualisation — Concept evaluation, iterative design process
Ch.6 Final design
Ch.7 Evaluation

Graduate!

Xinyi Wang
Driver-centered Human-machine interface design
for a better takeover experience in level 4 automated driving
29 of April, 2020
MSc Design for Interaction

Committee   Elmer van Grondelle
René van Egmond
Wouter kets

Project   Mediator

Faculty of Industrial Design Engineering   **Delft University of Technology**