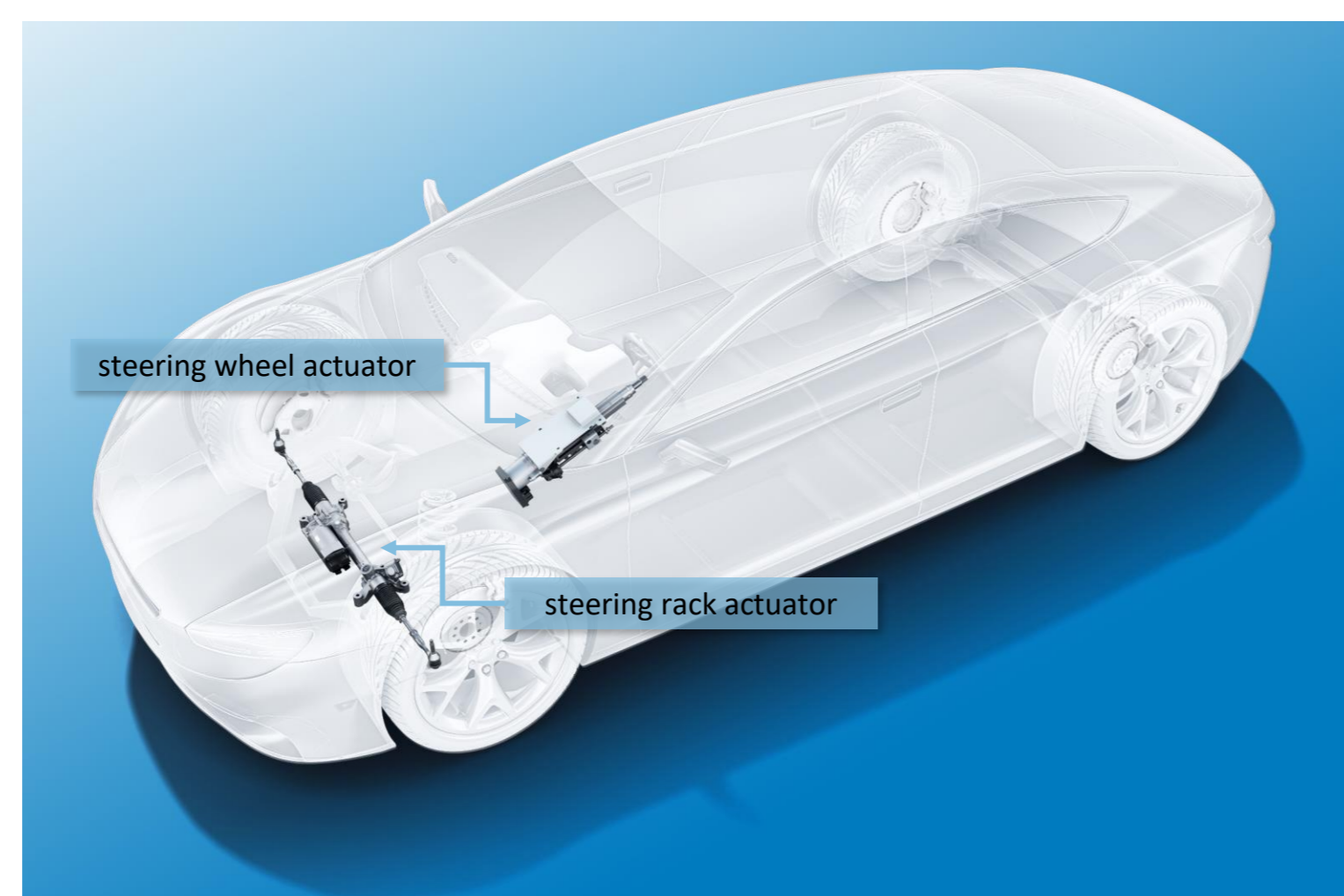


Development of New Driving Devices

1 | Steer-by-wire

- ★★★★ innovative functionalities
- exciting user experience
- automated driving
- mounting & packaging space
- cost reduction
- new interface & interior design



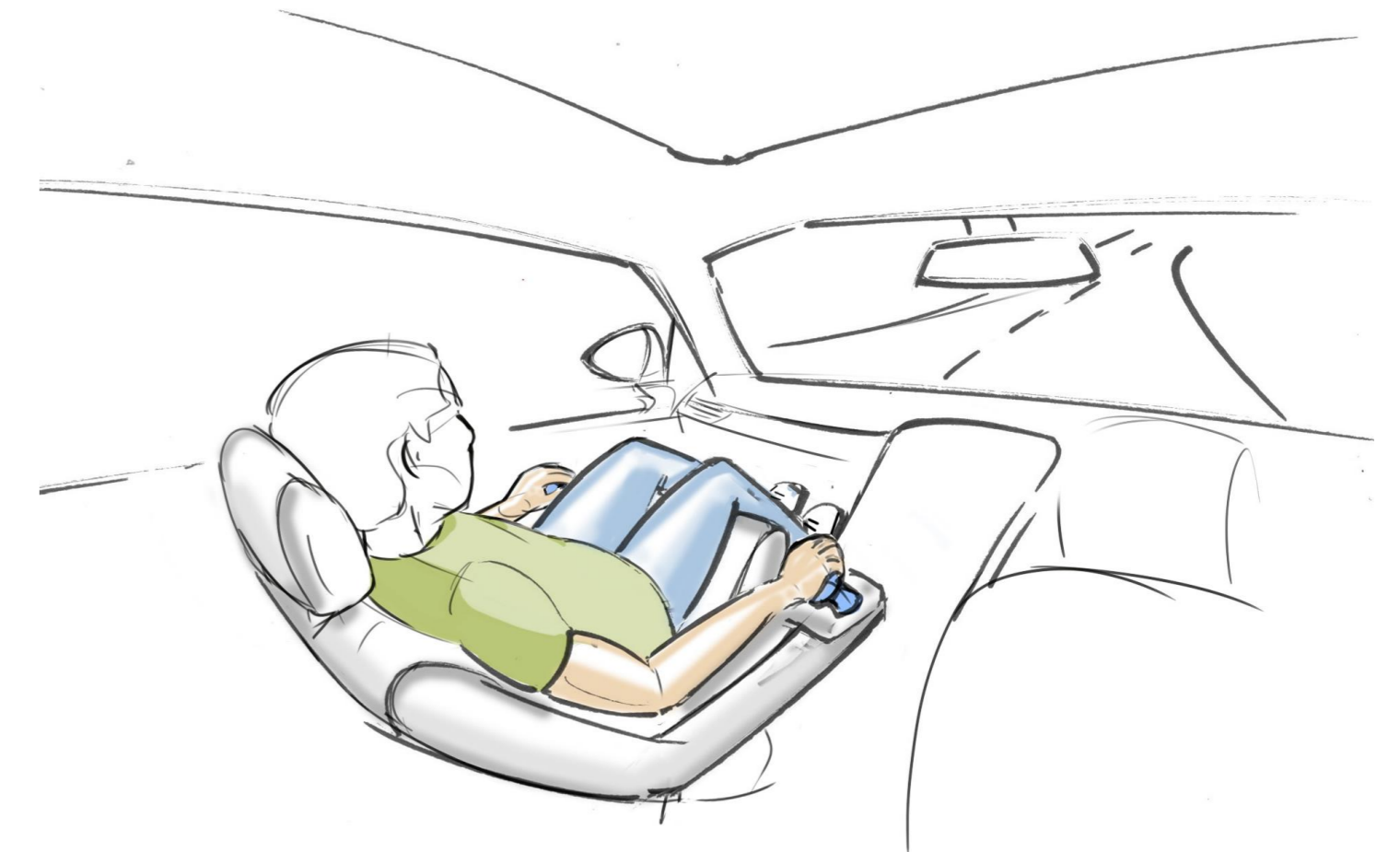
2 | Vision

Function

- By-wire driving HMI with joystick-like devices

Features

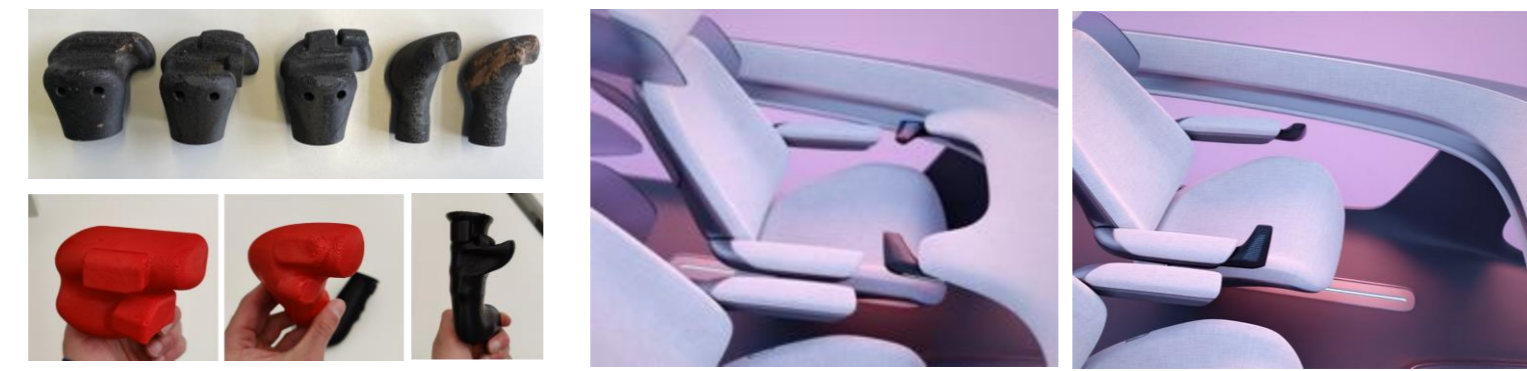
- Controlled steering feel with force feedback actuator
- Integrated operation of steering, braking and accelerating



3 | Studies

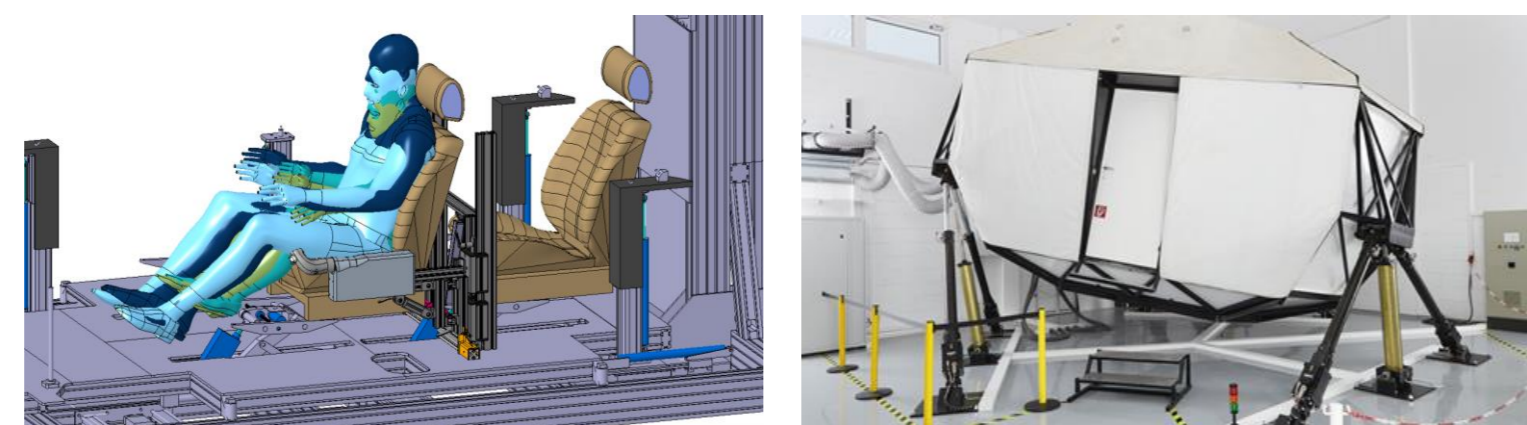
Expert workshops

- Functions and handle design
- Interior concepts



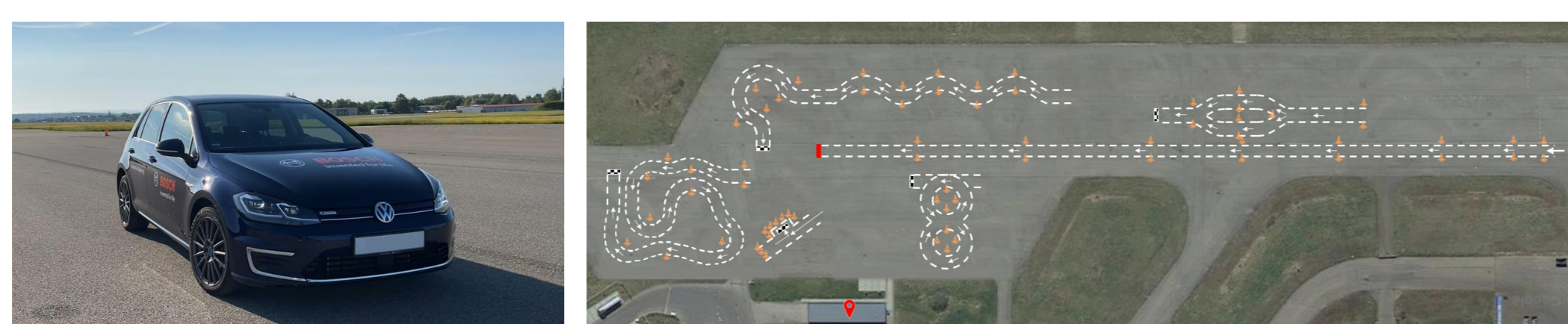
Simulator studies

- Ergonomics and adjustability
- Transitions during automated driving



Driving studies

- Dual vs. single device
- Maneuverability



4 | Prototype



4 | Key findings

Driving feel ★★

- "Steering is very intuitive."
- "I had the feeling that I could control the vehicle much better."
- "After only a few meters you get used to it and can drive safely and fast with it."

Interior flexibility 💡

- "There is so much more space in front of the driver."
- "Freedom of movement because of the available space."
- "The interior is very neat. It looks smart and modern."
- "Also suitable for the elderly and people with disabilities."
- "Better view through the windshield."

Experience 🚀

- "Very innovative."
- "Extreme driving enjoyment (despite the prototypical implementation)."
- "Super cool realization, I am totally thrilled!"
- "It was a great experience!"
- "I could have spent days on it."

Automated driving 🧠

- "No annoying steering wheel in the automated driving mode."
- "The instrument cluster allows more degrees of freedom for automated driving."

Seating position 🪑

- "Comfortable position. The arms rest comfortably on the device."
- "Seating position is more variable."