ARCHITECHTURING THE JOURNEY

Exciting new technologies like XR and AVs offer new research opportunities. As vehicles become more autonomous, users' roles and relationships change. Companies see potential for offering new experiences for repurposing this time in commuting. Due to their complexity, XRinAV's intersections and implications must be thoroughly examined, particularly in terms of user perception, values, concerns, and potential interventions. This project explores these complexities and bridges technological, design, and user experience gaps. We use a blend of context mapping and speculative design to explore the futures.

Speculating integration of immersive technologies in autonomous driving

"How might we design safe & meaningful XR interventions for users (in in-journey experiences) with different levels of immersion and autonomy?"

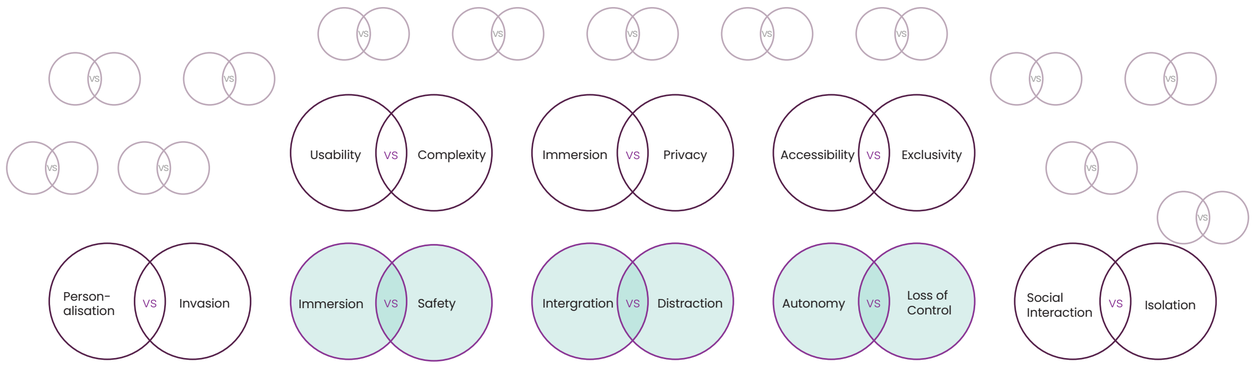
XR in AV

Research

TENSIONS IN THE SPACE

Initial research established an understanding of how levels of autonomy and levels of immersion interact with each other. Understanding prominent trends informed the trend analysis that was integral to building plausible scenarios

Tensions were mapped using stakeholder analysis and trend analysis. These tensions are important to resolve for greater acceptance of future technological interventions.

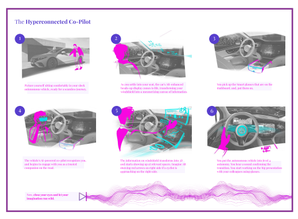


SPECULATING SCENARIOS

Using the methodical approach of speculative design and leveraging tensions implicitly and explicitly, various interventions were designed in visual form. The XR interventions were designed for both driving and non-driving tasks.

The scenarios were used as conversational probes in the context mapping session, which allowed participants to empathize with their future selves.

EMBODYING TENSIONS THROUGH SCENARIOS



THE HYPERCONNECTED COPILOT



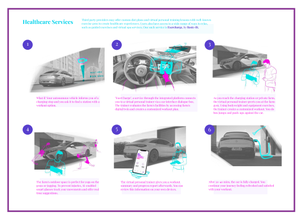
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HYPERSONALISATION WITH AR



FUTURE XR4AV PLATFORM



IN-CAR IMMERSIVE SERVICES

MAPPING THE CONTEXT

Through user interviews and analysis, we uncovered AV and XRinAV tension dynamics. We gauged user needs, expectations, and reservations, pinpointing conditions for mainstream AV and XRinAV adoption in various situations. This insight informed which HMI aspects to emphasize in design. Safety emerged as a paramount theme after consulting experts and clients.

Privacy has been renegotiated



Safety is the primary condition for immersion

PRIOROTISING SAFETY RELATED TENSIONS

How might we design interventions to resolve the tension between immersion and safety?

The value of co-presence is pivotal in XRinAVs



An Ideal Takeover

Design

DESIGN APPROACH

A key finding was that safety tensions rise during control negotiations between the system and its users, which is especially noticeable in takeover (TO) scenarios. This phase's design approach was centered on creating an ideal TO journey. The goal was to transition a first-time user from an immersive state to vehicle control while removing safety-related tensions.

KEY CHALLENGES

1. Delving into Phases and timeframes
2. Determining the roles of users and systems
3. Deciphering Communication Needs
4. Crafting Interaction Displays
5. Selecting Suitable Interaction Modalities

DESIGN FEATURES

Several interesting UI and interior features were introduced in the concept, notable ones are:

- **Floating display:** the visual display that stays constant at all levels of autonomy
- **Expressive intelligence** is a projection-mapped visual interface that communicates the system's driving stability.
- **AI conversational modality:** to communicate with effective directibility
- **Adaptive UI:** as the roles change with levels of autonomy, the interface adapts to the commanication needs.



KEY RESULTS

The video of the ideal TO journey was used as a speculative scenario in focus group sessions with field experts. These assessments paved the way for tangible insights and charted the course for future research.

Proposed 8-phase interaction flow seems effective for communicating the necessary

Call for standardization in color schemes across industry

Multimodal displays are most desirable for effective HMI

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ARchitechturing the journey:
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MSc Integrated Product Design

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