Augmented reality for intelligent vehicles (ARV 2017)
-- Workshop notes --

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Aim: Define research agenda

- Describe practical usage
  - Successes, failures
  - Performance, physiological, subjective measures
  - Who has the data?
- Identify challenges and hypotheses
- Outline research roadmap
- Other?

Describe practical usage

- Successes, failures
- Performance, physiological, subjective measures
- Who has the data?
  - Sabine: links to videos
  - Hidde: code for communication
  - Eye tracking data: TUM

Identify challenges and hypotheses

- Sabine:
  - can it help safety?
  - Takes up large volume, cost?
  - Is the car intelligent-enough for AR? Latency is a problem
- Pietro:
  - H: we improve trust in AI
  - No scalable-, affordable simulation tools
- Stephen:
  - H: VR to escape the confines of the car
  - Problem: motion sickness (vestibular and visual cues don’t match)
  - H: manipulate VR display to reduce motion sickness
  - P: Headsets are heavy!
  - P: Social acceptability
  - P: Cannot actually escape the space of the car: do you have the space for the gestures? How can we adapt interactions to the car?

Identify challenges and hypotheses

- Sanna:
  - P: Where is the driver’s focus in 3D (vs in 2D plane)?
  - P: How are the visual attention measures affected by AR (e.g. PRC)?
  - P: How are the performance measures affected: following, lateral?
- Markus:
  - P: Is there any productivity increase with visualization?
  - P: How/where to display AR in cabins with large glass surfaces

Identify challenges and hypotheses

- Andreas:
  - P: Trust in automation
  - H: Transparency (visualize black-box behavior)?
  - H: AR can help increase trust by showing negotiations between cars
  - P: Implementation:
    - processing power,
    - color scheme for all conditions
- Group discussion:
  - Accuracy of alignment to the road

Other?

- Eye tracking + AR
- Windshield displays, head-up displays
- Visual augmentation is not the only way we can augment experience
- Proprietary HUD technology – difficult for research
- Standards e.g. for safety purposes
- Remove reality for safety
- Cost of attention – blank out parts of the visual field to reduce distraction
- Confidence in information
- Audio AR – location, what info does it provide
- Eyes on AR or road

Outline research roadmap

- Pietro: new tools for realistic, reproducible test environments
- Sanna: re-visit measures
- Joe: using a small screen is a design challenge
- Extend to audio and other senses
- Role of AR in fostering trust
- AR to add, and to remove, information
- Visual attention to modulate AR displays