

# Designing Hybrid Societies

Thoughts in and on the CRC 1410 at  
Chemnitz University of Technology

2022-09-23  
GfA Herbsttagung, Leipzig

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**HYBRID  
SOCIETIES**

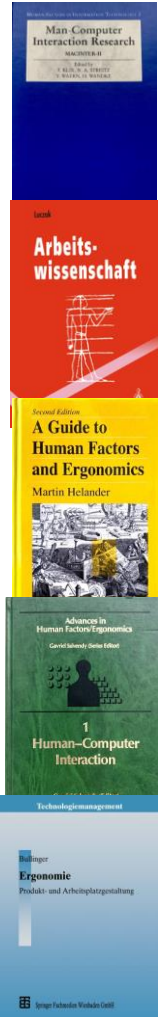
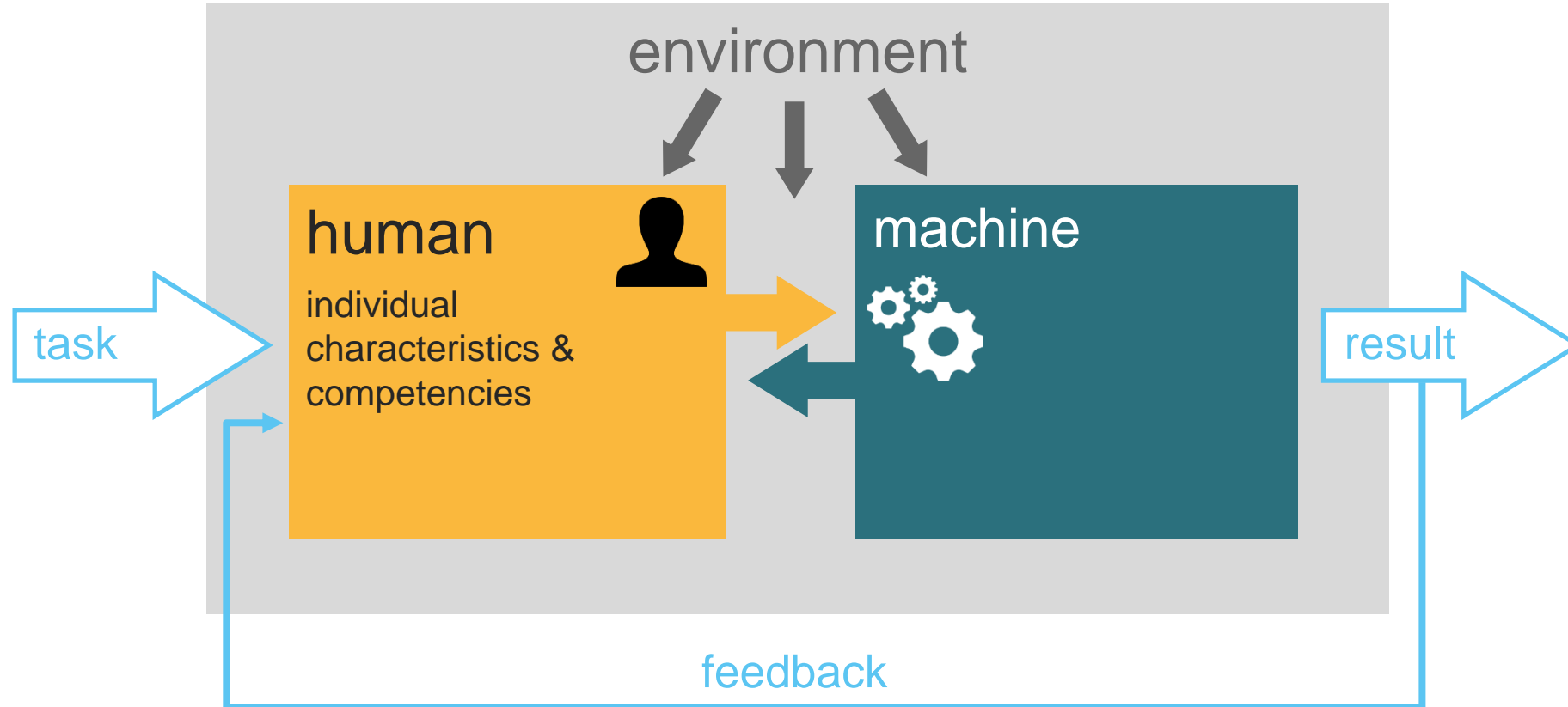




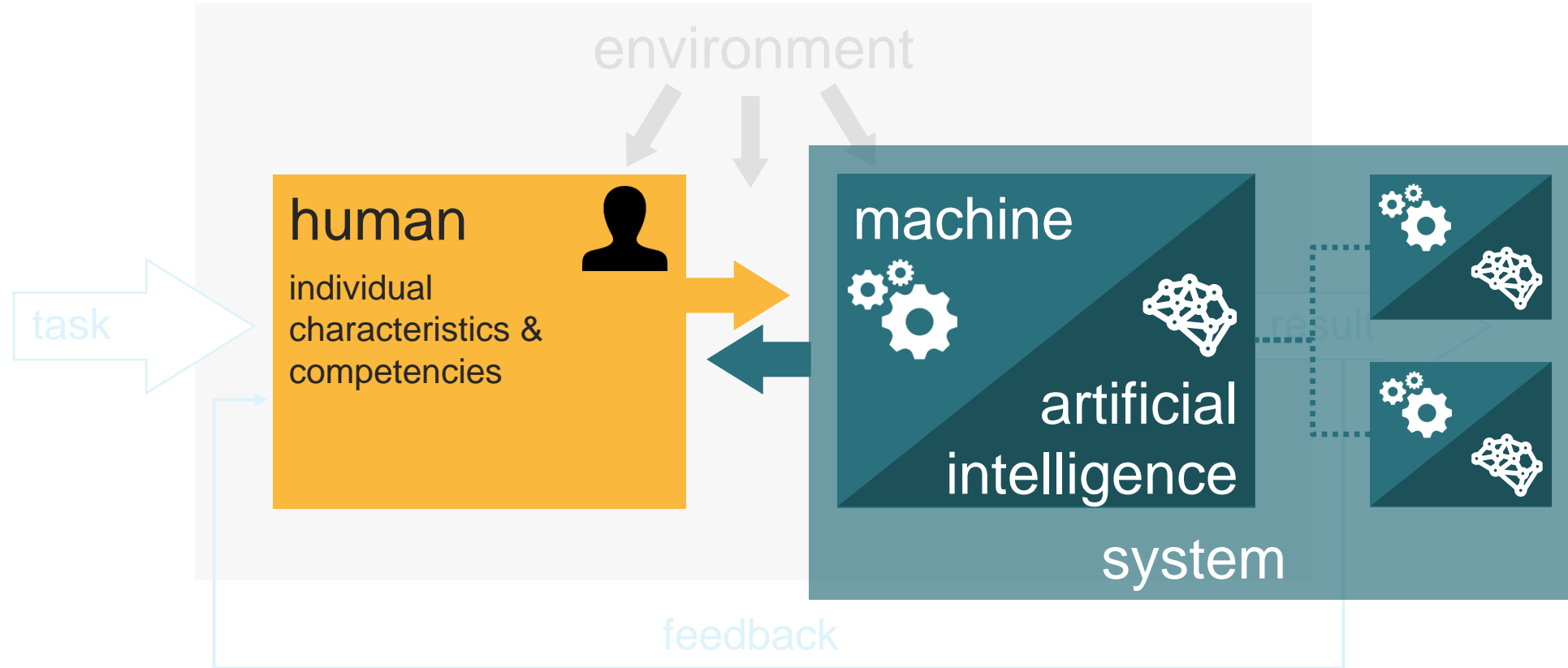
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# Human-System-Interaction

... we Still Look at Human-System-Interaction as Being Static...

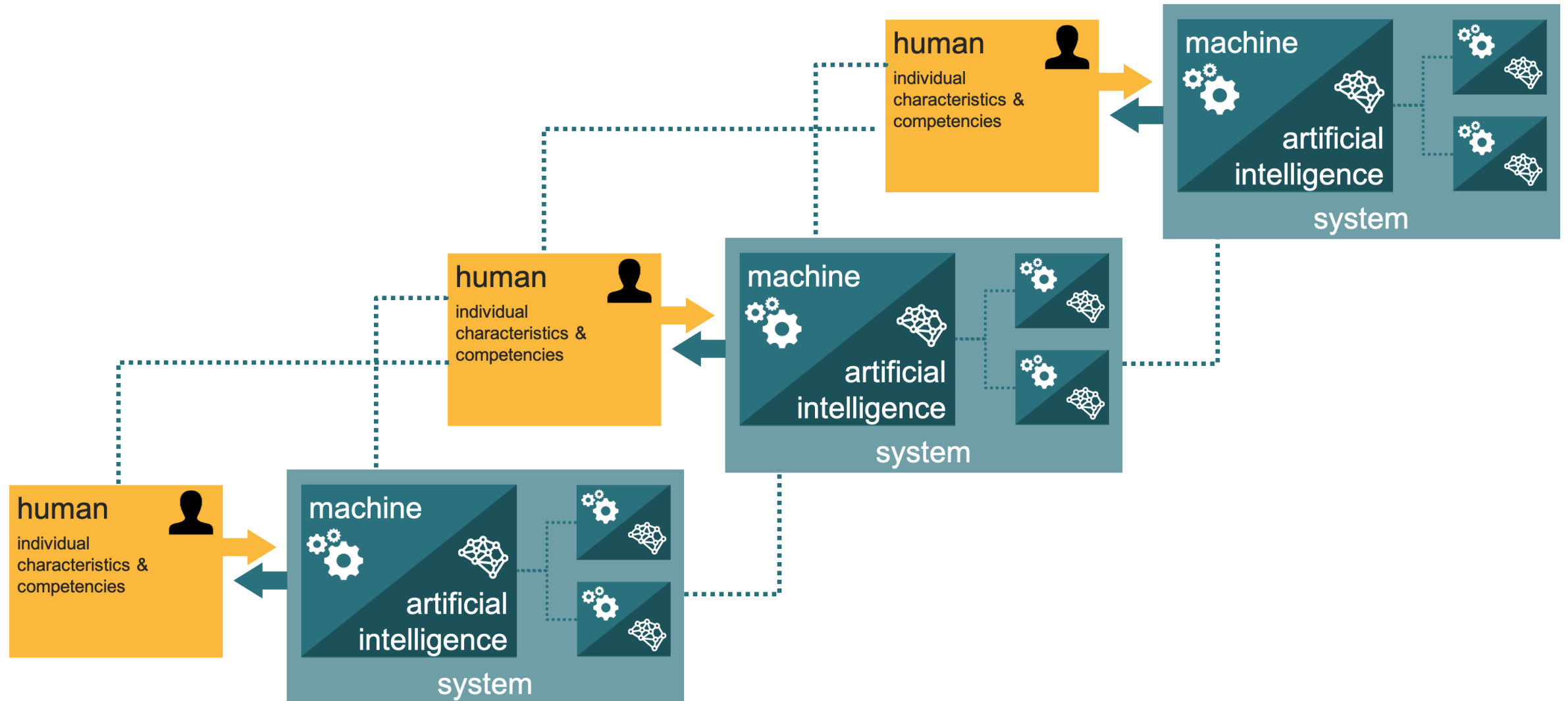


... While Systems are Emergent and Incorporate AI...





... and we Need to Design Hybrid Societies.







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# HYBRID SOCIETIES

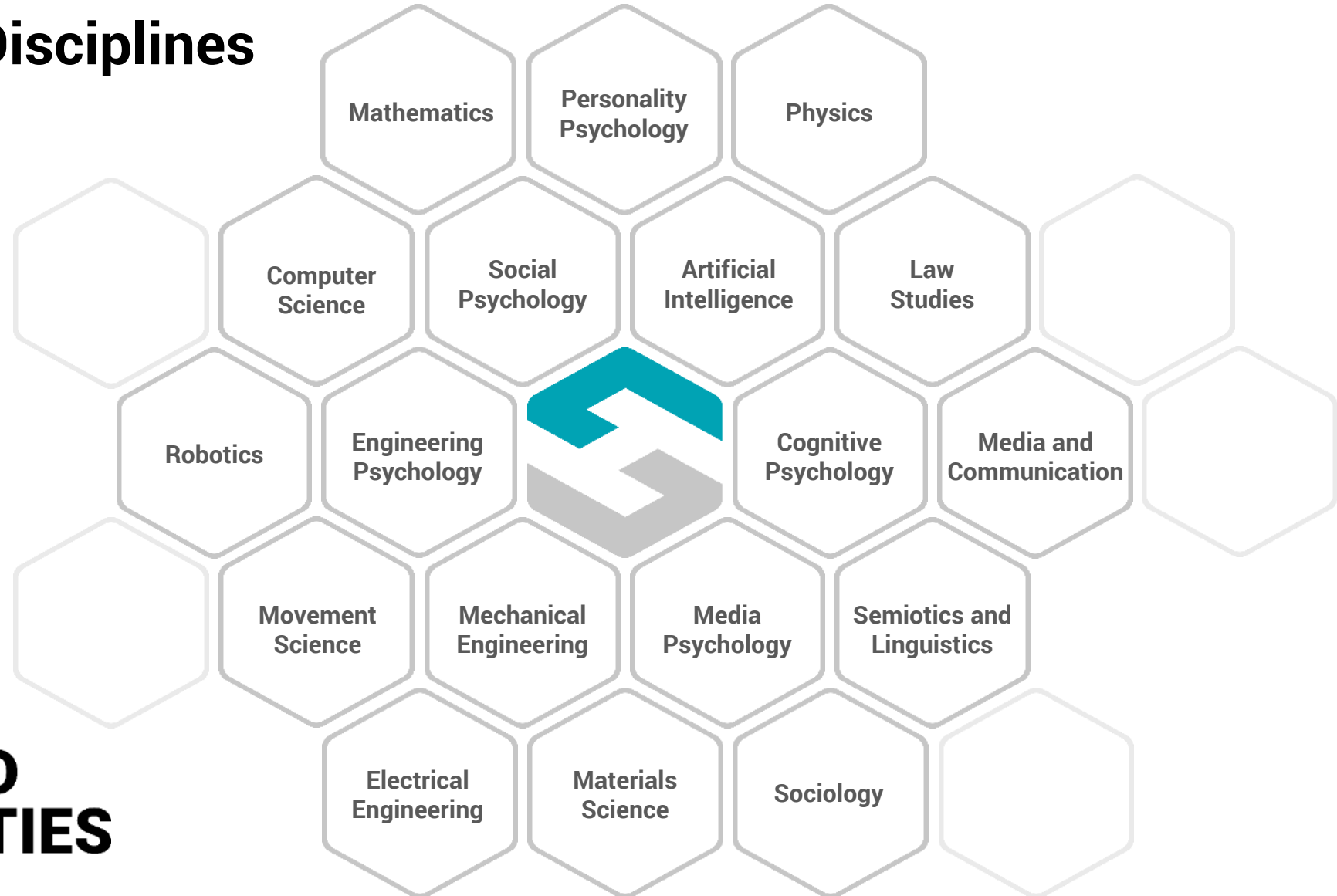
## Humans Interacting with Embodied Technologies

Coordinated Research Initiative  
of Chemnitz University of  
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# Collaborating Disciplines



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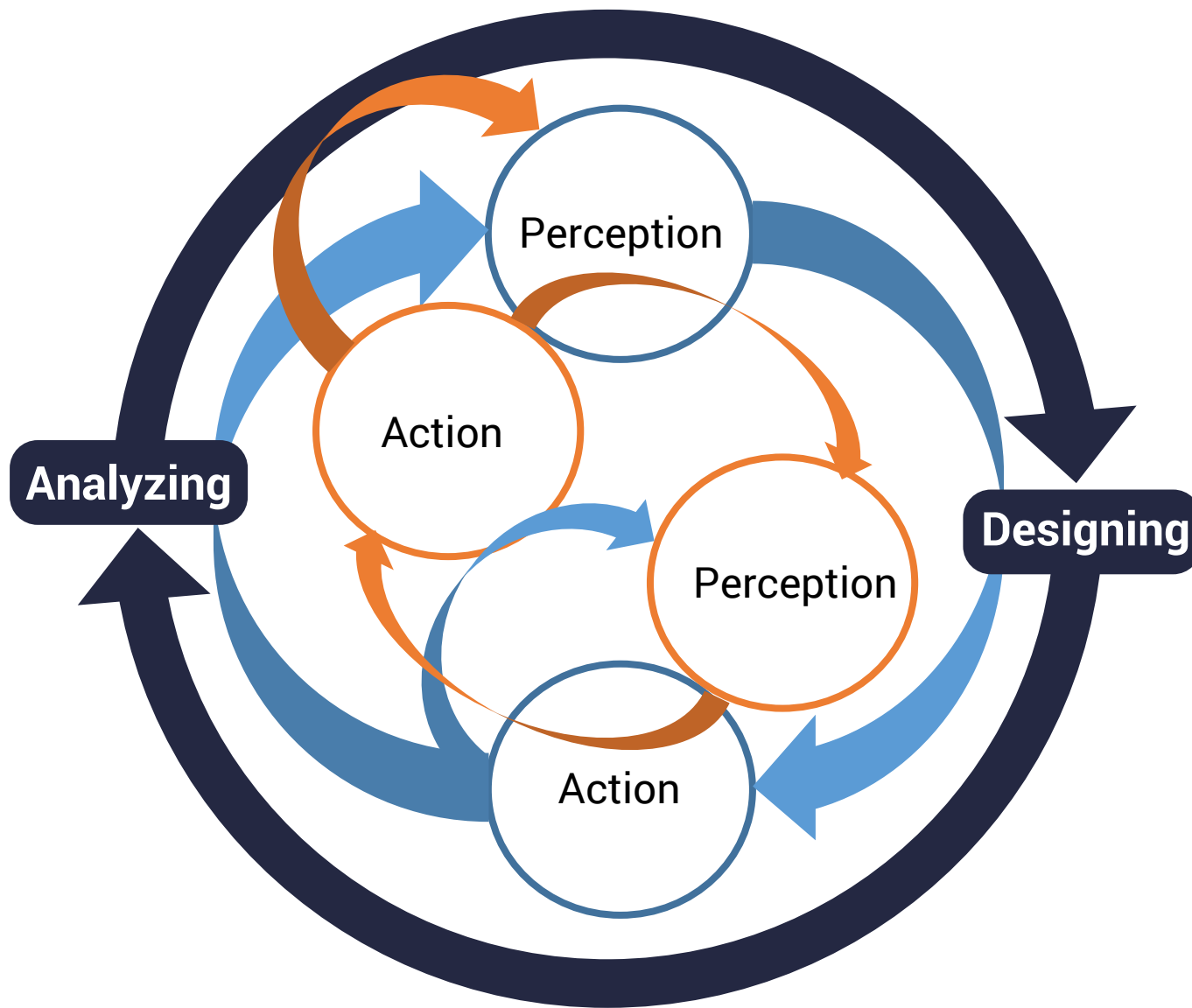
# Leading Questions

## Analyzing

**What is required** so that humans can coordinate with EDTs as smoothly as with conspecifics?

## Designing

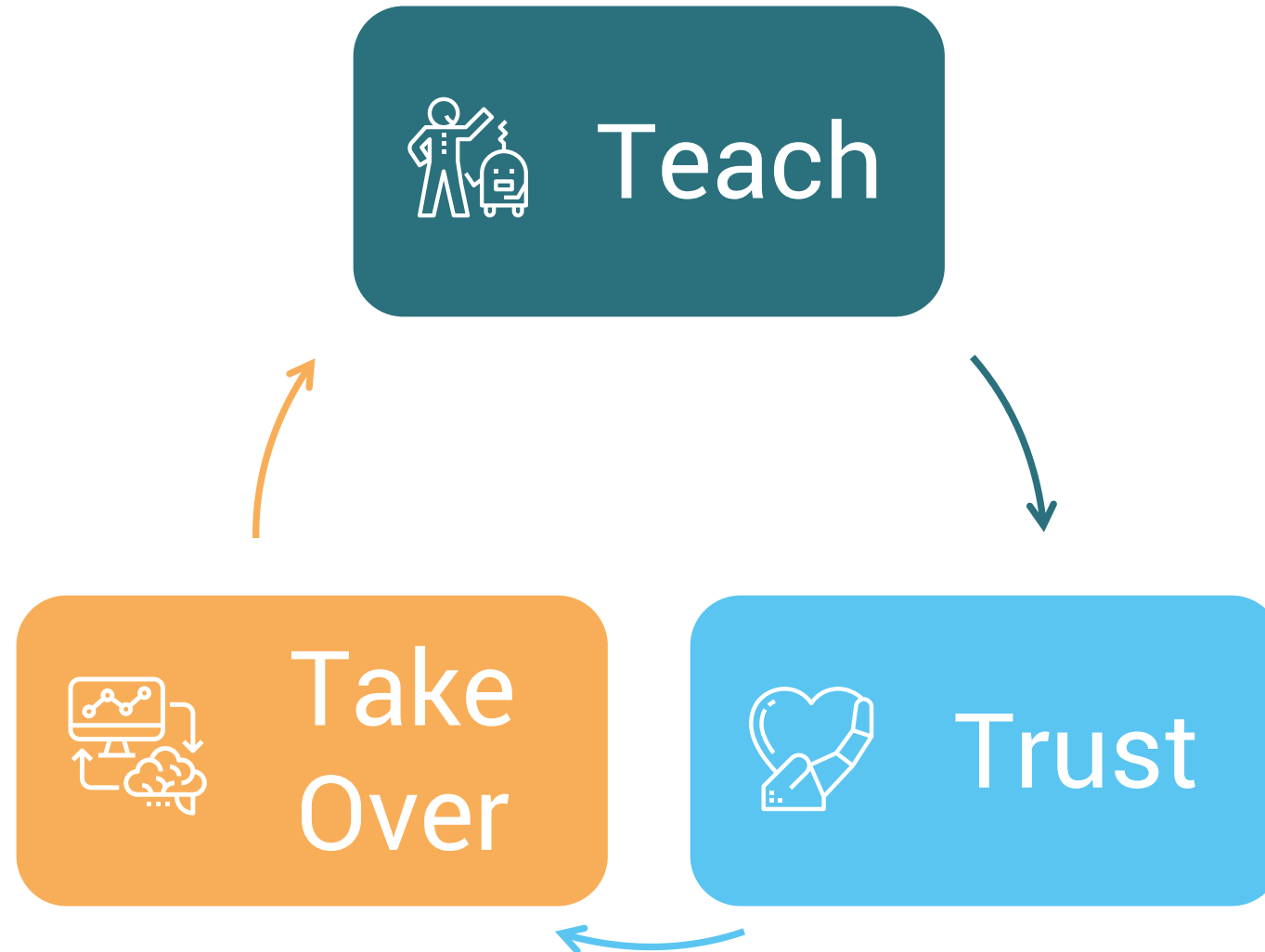
**How to design EDTs** to meet these requirements **for** ensuring **beneficial hybrid societies**?







# Investigating the Hybrid Society Lifecycle





2

How to  
Teach your  
System?

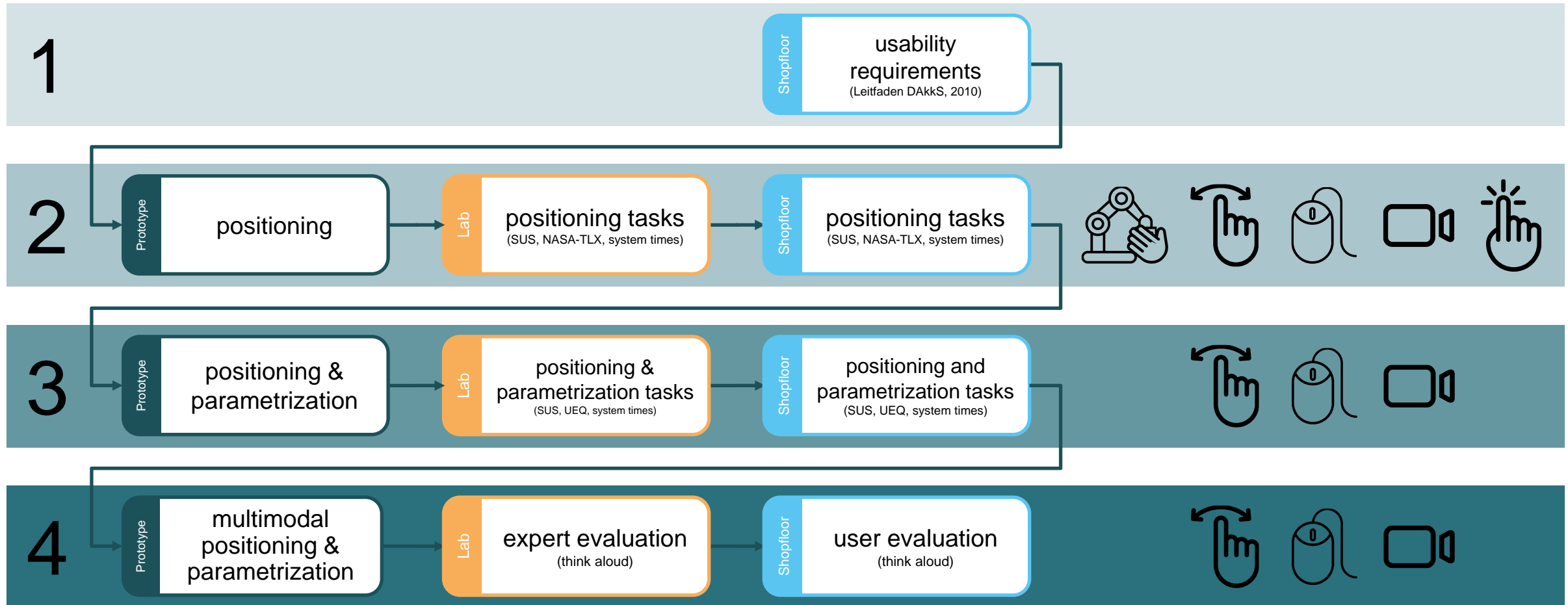






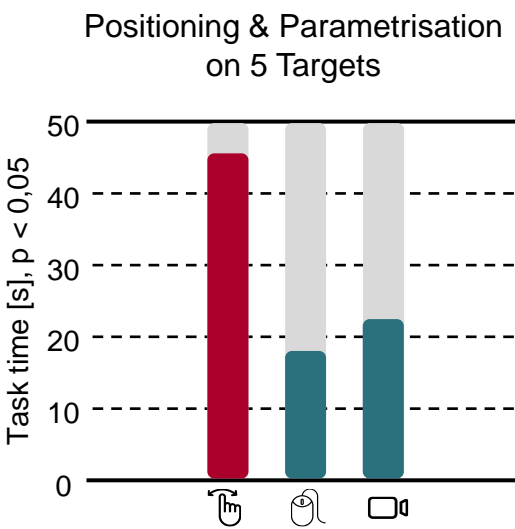
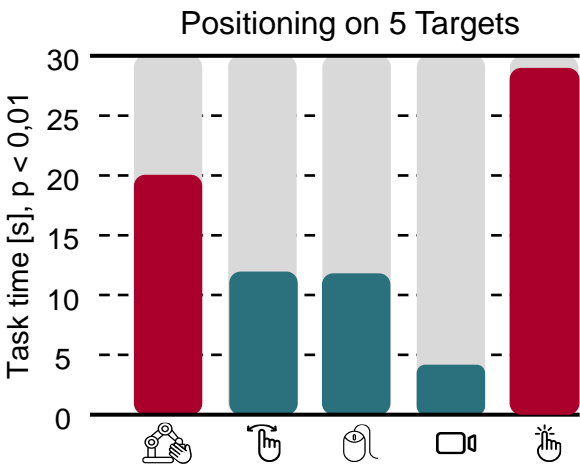


# Iterative Design Process with Lab and Field Studies











# Results of Evaluating Interfaces



Parametrisation

			
Positioning	 6	-	-
	 -	10	-
	 3	5	-



3

**How to  
Trust your  
System?**

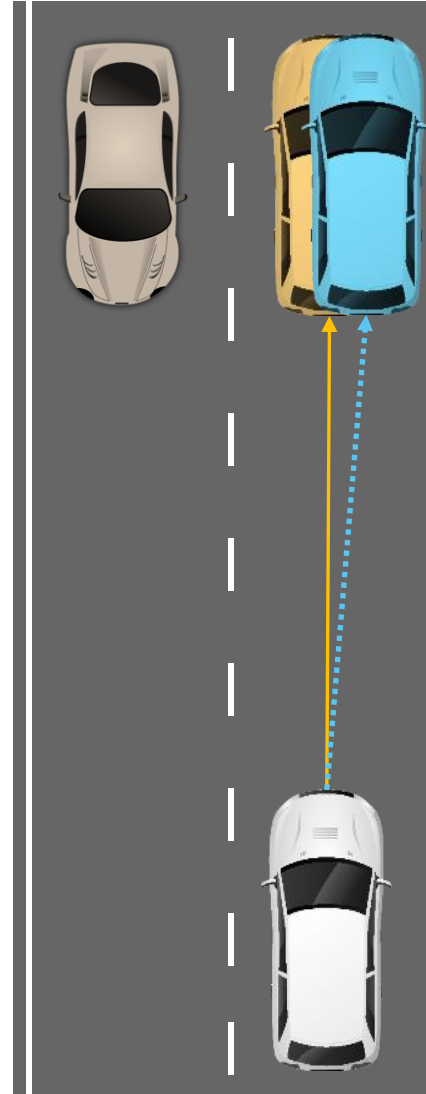




# Perceived Safety During Automated Driving



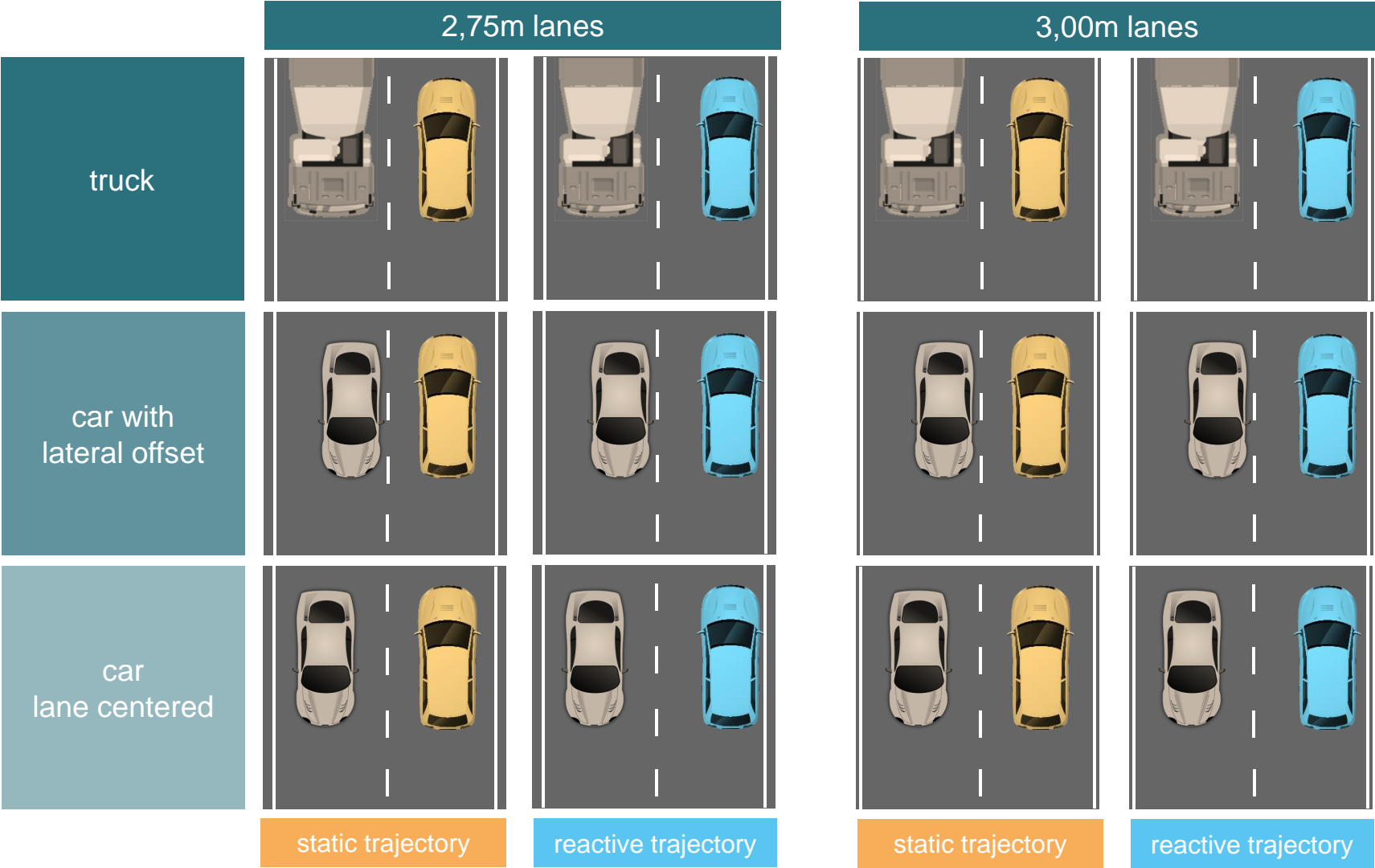
static trajectory



reactive trajectory



# 24 Traffic Scenarios





# Method Mix: Innovative and Established Measurements



during  
drive

mobile handset control for continuous feedback on **perceived safety** (Hartwich et al., 2015)

post  
drive

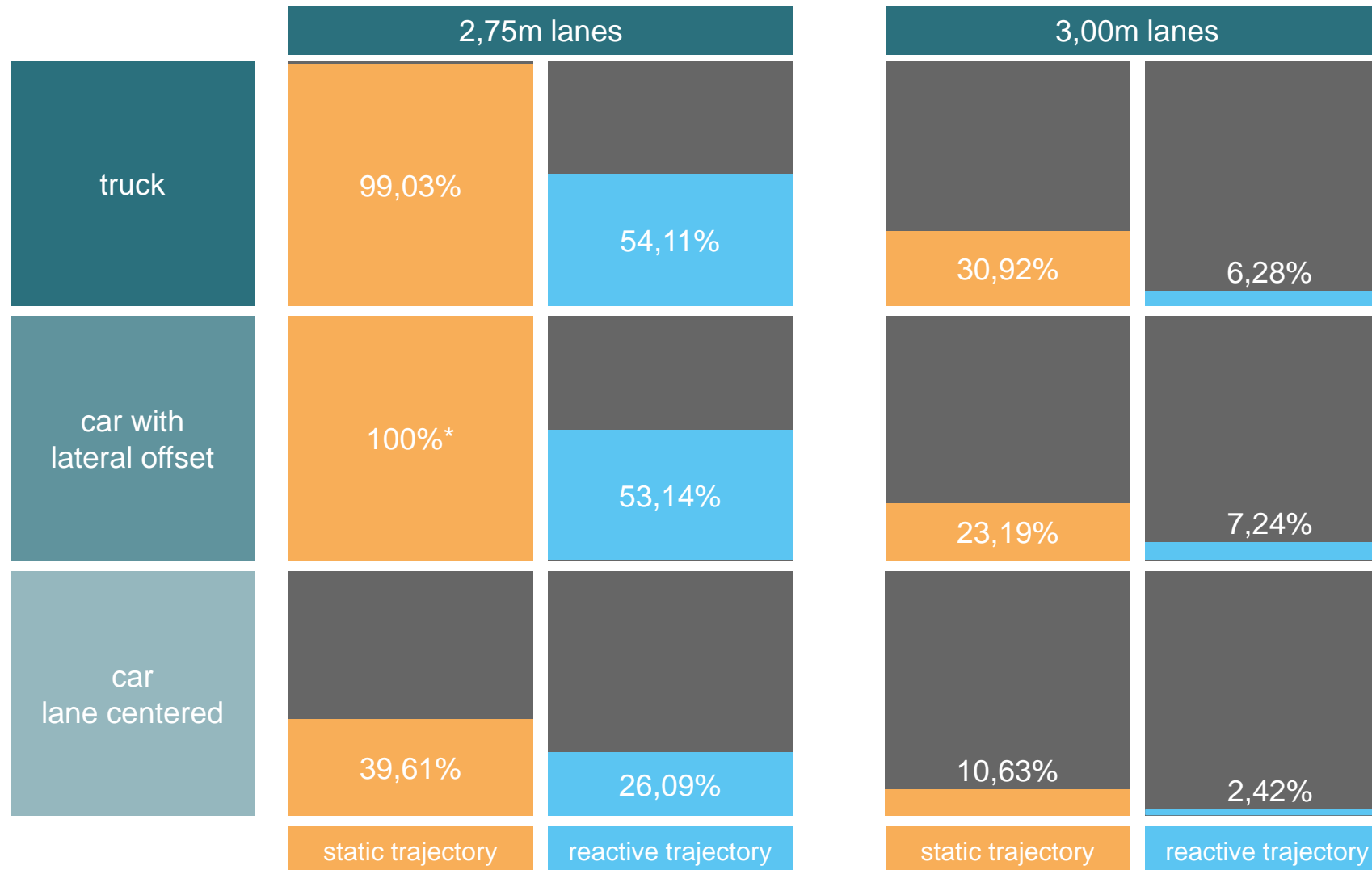
questionnaires on trust, **acceptance** and subjectively experienced **driving performance**  
(van der Laan & de Ward 1997, Jian & Drury 2000, Voß & Schwalm 2017)

single item ratings on perceived safety, **driving comfort**, **driving joy** and **driving style**  
(Hartwich et al. 2015)



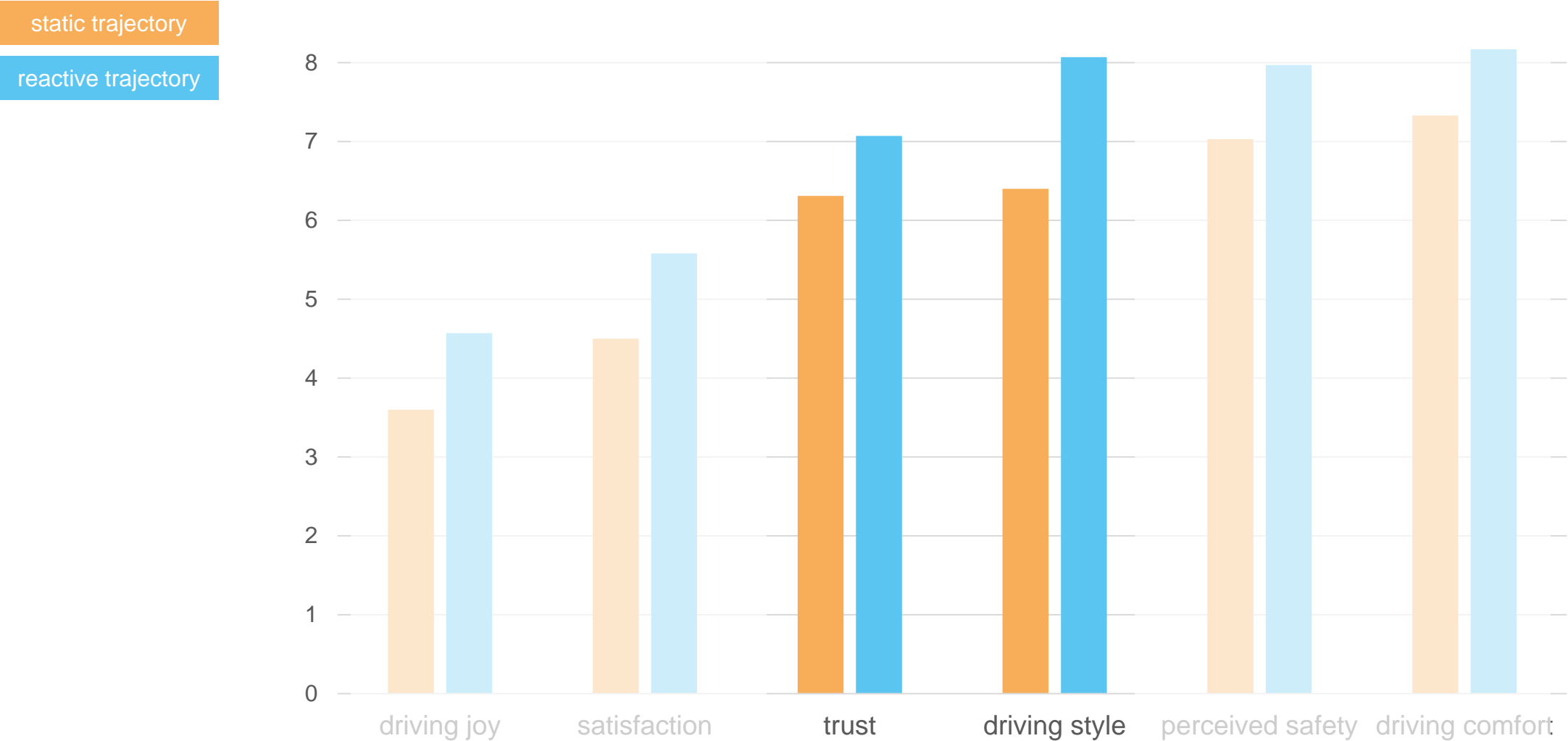


# Handset Control Values for Safety Concerns





# Reactive Trajectories are Perceived Significantly Better





4

How to Take  
Over From  
Your System?





# Cognitive Fatigue due to Monotonous Drive



# Method Mix: Collection of Different Data Types

activation

Karolinska Sleepiness Scale (KSS) (Åkerstedt & Gillberg, 1990)

physio-  
logical

pupil diameter

eye closure

skin con-  
ductance (SCL)

heart rate (HR)

breathing  
frequency (BF)

vehicular

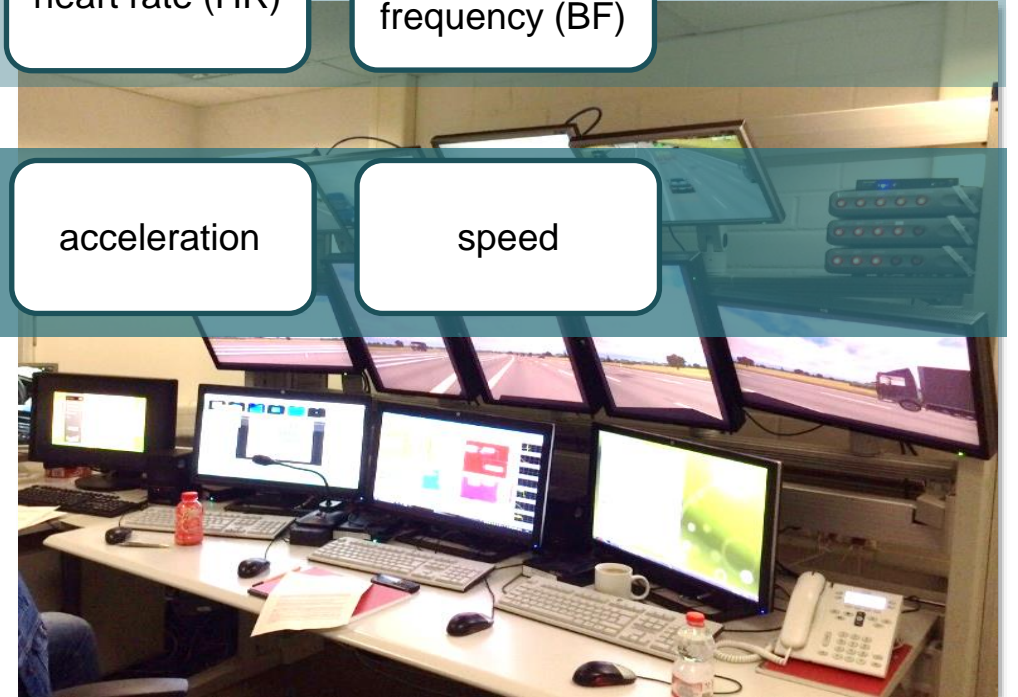
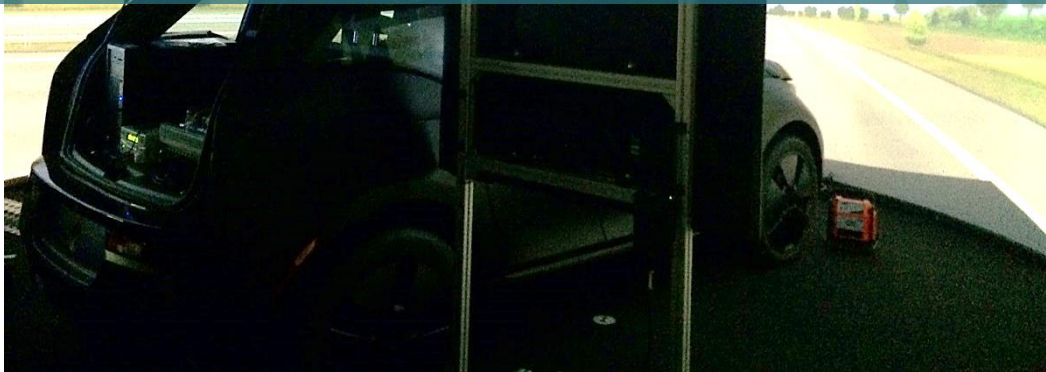
lane keeping  
quality

longitudinal  
jerkiness

steering  
movements

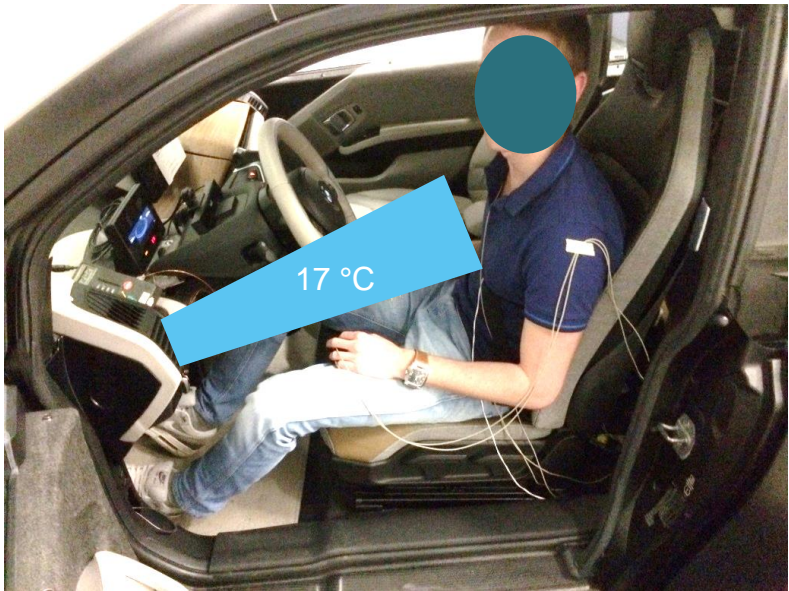
acceleration

speed



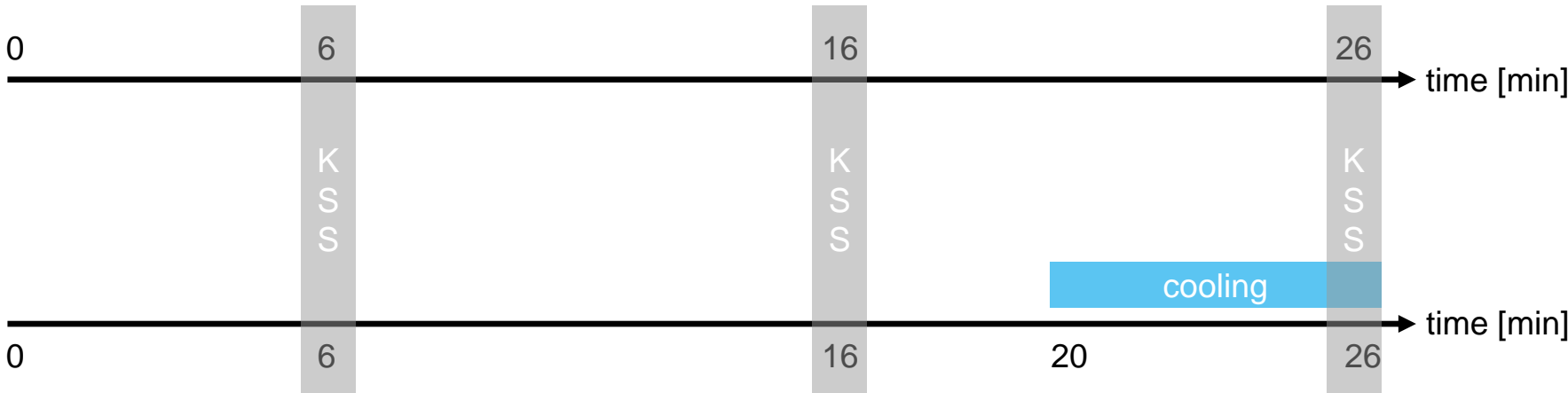


# 2 Drives with and without Cooling



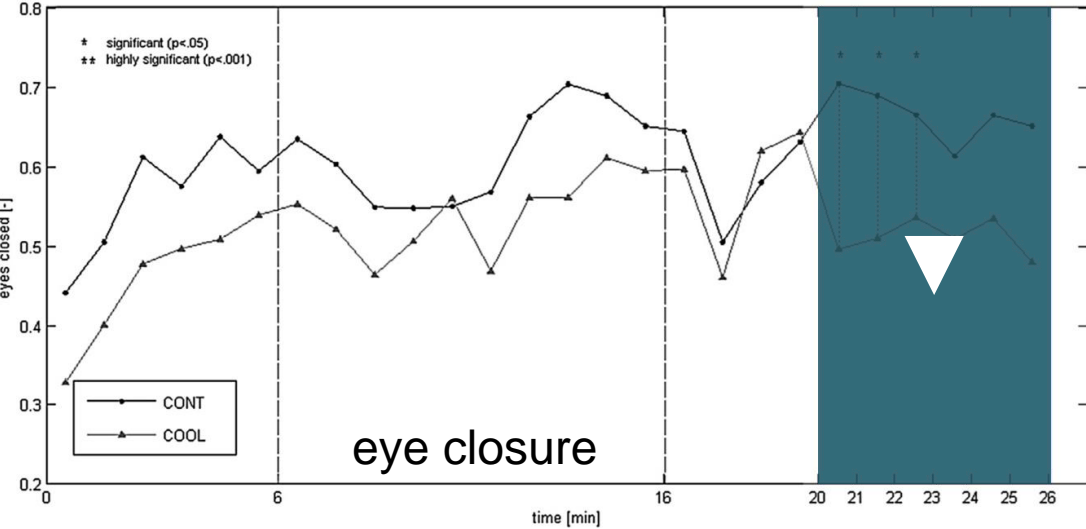
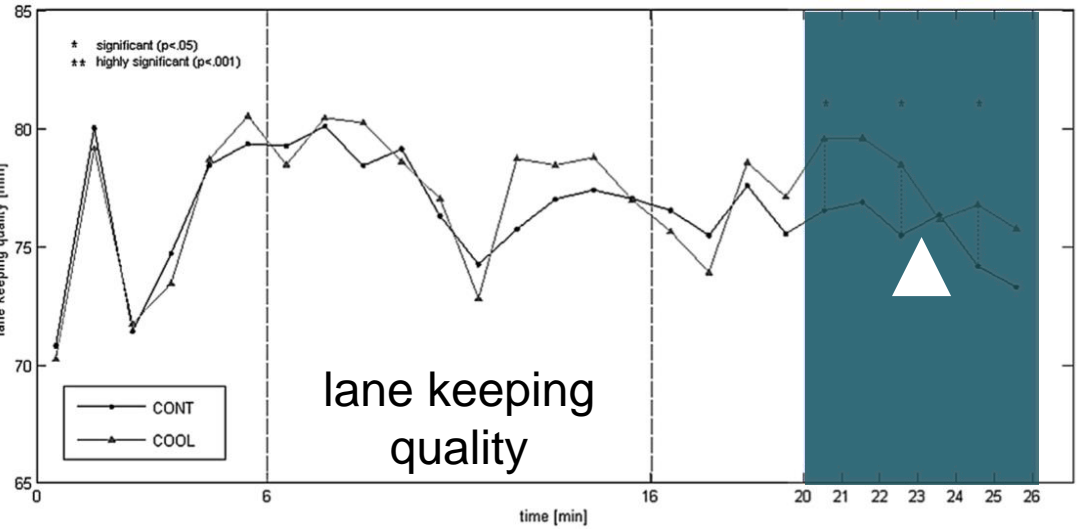
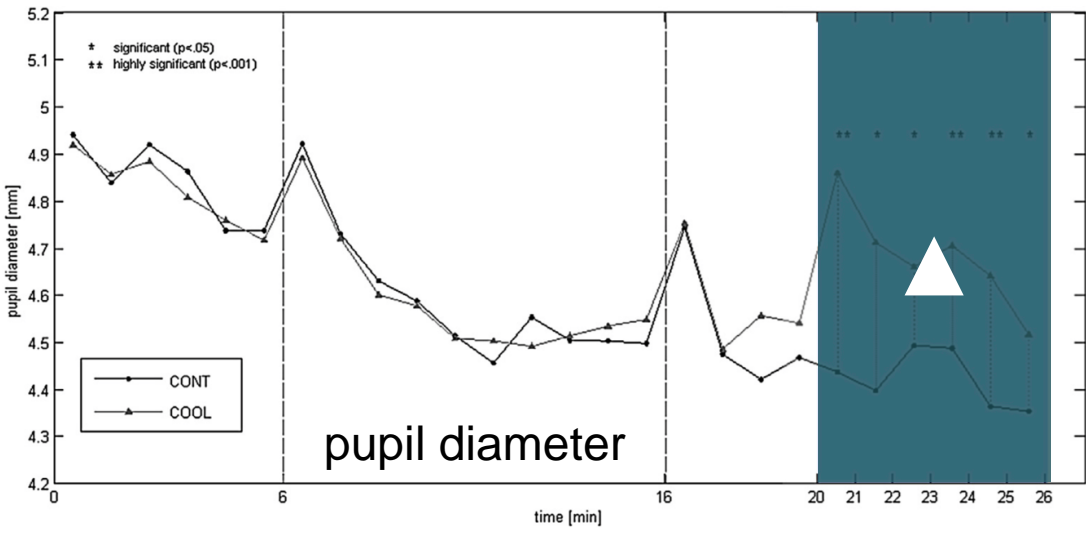
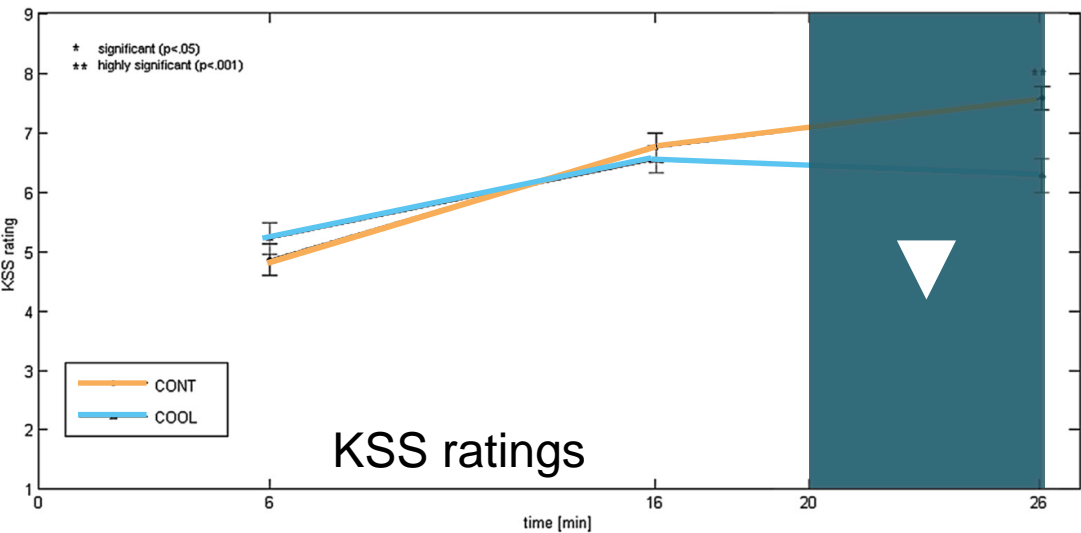
  
Drive w/o  
cooling CONT

  
Drive w/  
cooling COOL

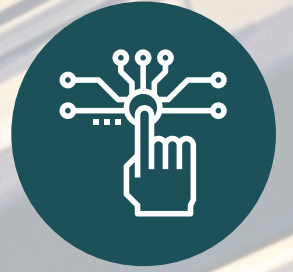




# KSS, Physiological and Vehicular Data Show Effect of Cooling





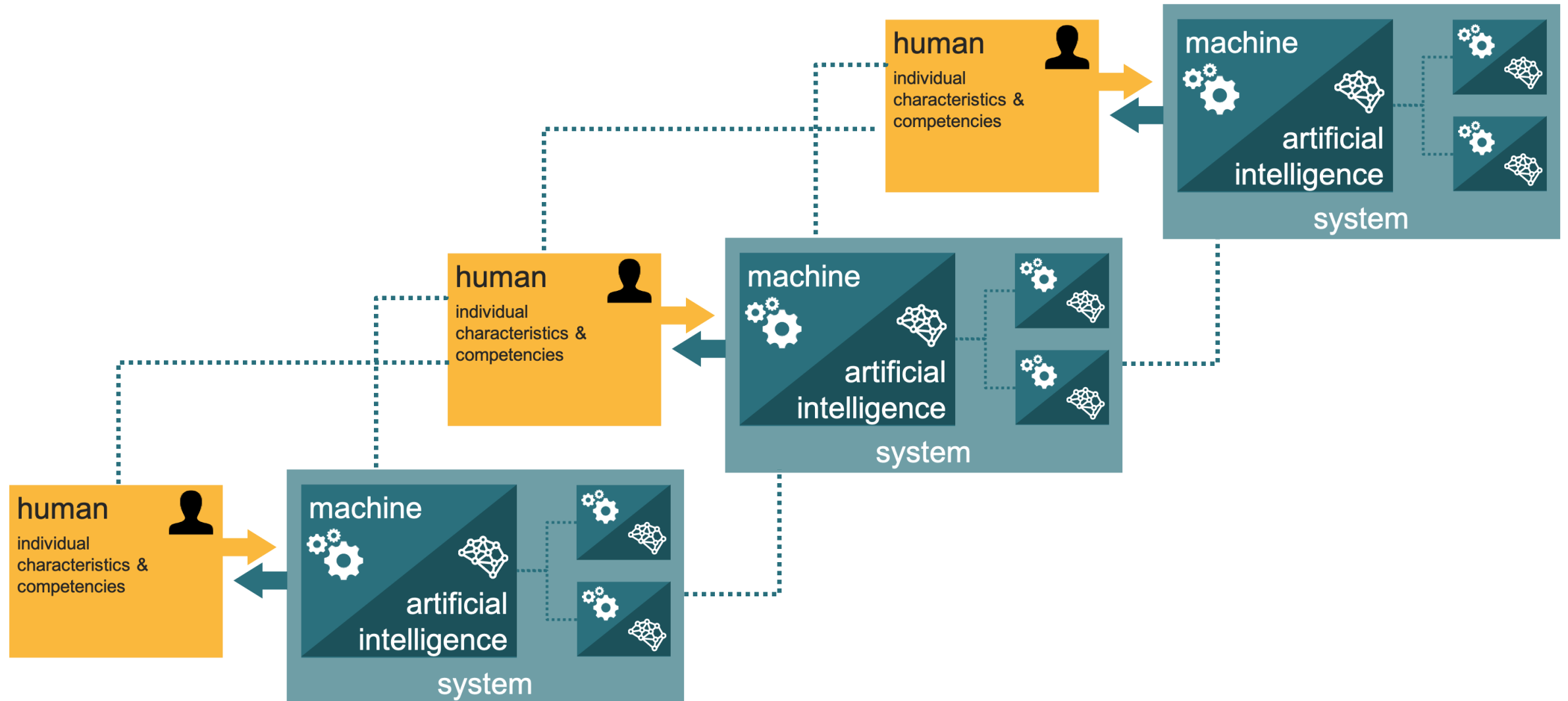


5

Conclusion

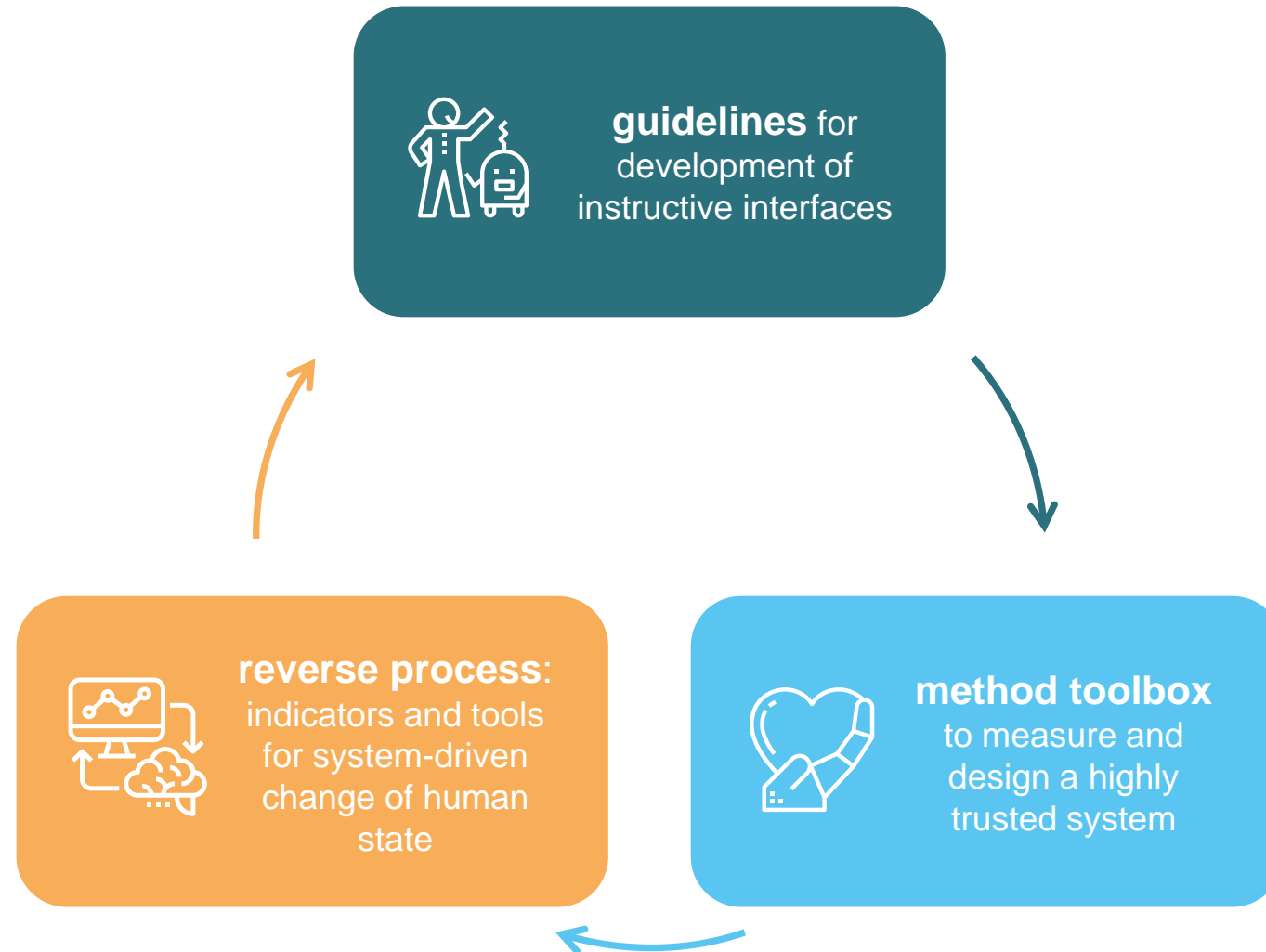


... and we Need to Design Hybrid Societies.





# Towards Designing the HS Lifecycle: First Guidelines





# Thank you.

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2022-09-23

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