



HUMAN-MACHINE-
INTERACTION

The influence of non-driving related tasks on take-over performance

MOTIVATION


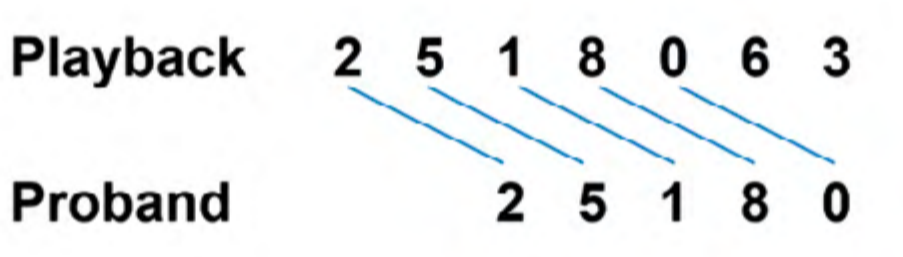

- Non-driving related tasks (NDRTs) could affect the driver state and availability for a take-over
- What effects do **different NDRTs** have on the **driver state** and how do they affect the **take-over performance** in **different scenarios**?

METHOD

- Driving simulator (static) study
- n = 53, mean = 32 years (SD = 16y)

Experimental design

- Between subject factor:
Type of NDRT/Modalities of the NDRTs

Visual-motoric	Cognitive	Motoric
Surrogate Reference Task	N-back Task (N = 2)	Shape-sorter ball
		

- Within subject factor: instruction

Instructed	Free
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- Within subject factor: situation

Crash site	Construction site
	

Measures

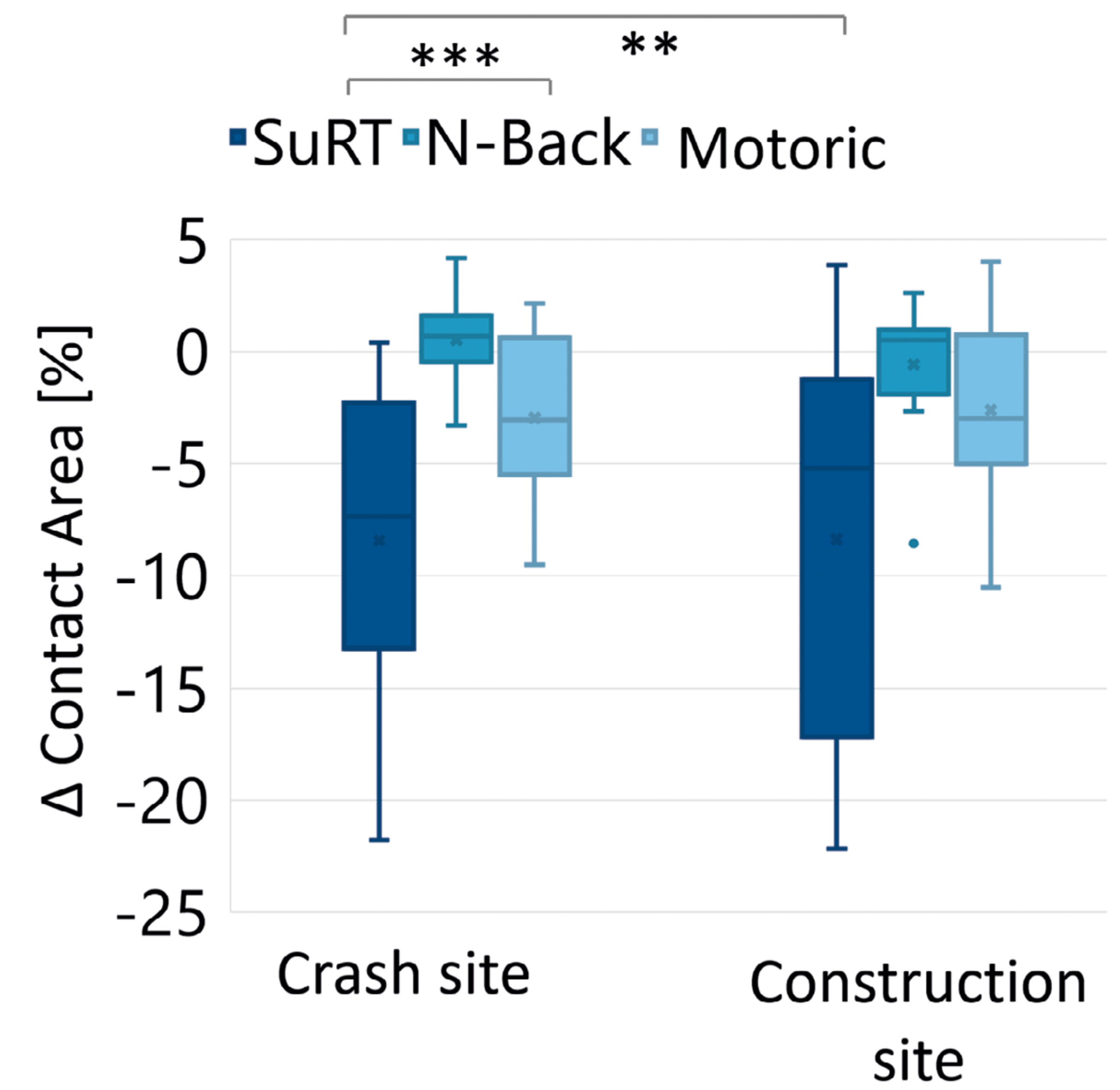
		
Eye-tracking	Seat pressure mats	Vehicle dynamics

RESULTS

Driver state: Non-driving related tasks (NDRTs) show significant differences concerning

- Percent eyes on road (the SuRT leads to less PEOR compared to the other tasks)
- Changes of the mean contact area and the center of pressure (COP) in the backrest (SuRT shows most changes, activity of drivers)

Changes of the mean contact area in the backrest



No significant differences concerning the factor instruction.

Significant differences between the take-over situations concerning

- Take-over time
- Time-to-collision
- Longitudinal and lateral accelerations
- Subjective ratings from participants

SUMMARY

Different NDRTs (modalities)

- influence the driver state and can be detected using eye-tracking and seat pressure mats
- do not affect the take-over performance

MORE DETAILS

Radlmayr, Fischer, & Bengler. (2018). *The Influence of Non-Driving Related Tasks on Driver Availability in the Context of Conditionally Automated Driving*. To be presented at the 20th Congress of the International Ergonomics Association in August 26–30, 2018, Florence, Italy