

Ergonomisches Seminar - Seminarprogramm

April 2023 – Juli 2023



Lehrstuhl für Ergonomie
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Die Seminarreihe am Lehrstuhl für Ergonomie

Die seit mehreren Jahren regelmäßig stattfindende Seminarreihe des Lehrstuhls für Ergonomie ist ein Forum für an ergonomischen Erkenntnissen interessierten BesucherInnen. Das Seminar bietet unseren Doktoranden und Doktorandinnen die Gelegenheit, ihre Arbeiten in diesem Forum zur Diskussion zu stellen. Aber auch Kollegen und Kolleginnen aus der TUM School of Engineering and Design sowie VertreterInnen aus der Industrie referieren über die große Bedeutung der Ergonomie in der interdisziplinären Zusammenarbeit und in der Praxis. Ich würde mich freuen, wenn unser Programm Ihr Interesse findet und ich Sie bei einem der Termine persönlich begrüßen kann.



Prof. Dr. phil. Klaus Bengler



Aufgrund der aktuellen Lage rund um das „Coronavirus SARS-CoV-2“ werden die diesjährigen Seminarvorträge sowohl als Präsenzveranstaltung sowie online durchgeführt. Sie haben demnach die Möglichkeit, sich mit folgenden Zugangsdaten in den Konferenzserver des Lehrstuhls für Ergonomie einzuwählen und sich mit den Vortragenden auszutauschen:

 <https://tum-conf.zoom.us/j/69920052540>
Zugangscode: 296568

Als Konferenzsystem verwenden wir Zoom. Bei Fragen oder technischen Problemen können Sie sich gerne an uns wenden.

Wir bitten um Verständnis, dass kurzfristige Änderungen im Programm auftreten können. Bitte informieren Sie sich über eventuelle Änderungen am Tag des jeweiligen Vortrages auf unserer Homepage.

FREITAG, 21. April 2023, 13.00 Uhr

Transition Phases with Minimal Risk Maneuvers of Automated Vehicles

Burak Karakaya, wissenschaftlicher Mitarbeiter am Lehrstuhl für Ergonomie

Vehicles of higher automation levels, which will have the ability to perform minimal risk maneuvers, will participate in mixed traffic. Previous research in this area was focused on the interaction within the automated vehicle and a change of perspective was therefore carried out in the latest study. This talk will give an overview of previous research and present the results of the latest study.

FREITAG, 21. April 2023, 13.45 Uhr

Teleoperation in Manufacturing

Theresa Prinz, wissenschaftliche Mitarbeiterin am Lehrstuhl für Ergonomie

During this seminar session, we will be presenting the results of a study that explores the learnability of a teleoperation system for assembly tasks, as well as its users' performance and cognitive strain. A design framework is developed that prioritizes user-centered HMIs for teleoperated robot control in manufacturing, and we will be discussing potential future study designs. The ultimate goal is to develop a teleoperation system that satisfies industrial requirements while also ensuring optimal usability.

FREITAG, 28. April 2023, 13.00 Uhr

User Experience in Human-AI Interaction

Rutuja Umesh Joshi, wissenschaftliche Mitarbeiterin am Lehrstuhl für Ergonomie

Evaluating and improving user experience in Human-AI interaction is difficult, because of the capability uncertainty and output complexity of AI. In this talk, the first overview of challenges and current state of the art will be presented.

FREITAG, 28. April 2023, 13.45 Uhr

Kooperative Längsführung für Nutzfahrzeuge

Jürgen Hauenstein, wissenschaftlicher Mitarbeiter am Lehrstuhl für Fahrzeugtechnik

Mit Hilfe der kooperativen Längsführung sollen die Kosten für Speditionen im Fernverkehr gesenkt

werden. Die entwickelte Methode verbindet die Forschungsbereiche des energieeffizienten Fahrens, der kollektiven Perzeption und der kooperativen Manöverabstimmung.

FREITAG, 05. Mai 2023, 13.00 Uhr

Driving with Visual Impairments: Determinants for Compensatory Strategies

Bianca Biebl, wissenschaftliche Mitarbeiterin am Lehrstuhl für Ergonomie

Some drivers with partial blindness can compensate for their visual deficit by making large gaze movements into the blind visual field. This talk will present driving simulator studies on contextual determinants for the adoption of adaptive compensatory strategies among patients and individuals with simulated visual field loss.

FREITAG, 05. Mai 2023, 13.45 Uhr

Investigating the Effects of a Fatigued Driver on Driving Performance after Conditional Automated Driving

Alexandra Löw, externe Doktorandin am Lehrstuhl für Ergonomie

Driver fatigue does not only affect the takeover performance per se, but also the driving performance of the manual drive afterwards. This talk will present a driving simulator study that investigated the effects of fatigued driving on driving performance in a longer manual drive after conditional automated driving.

FREITAG, 05. Mai 2023, 14:30 Uhr

Promoting operator competencies through conducive design of CPPS: Design and evaluation of assistance for mastering non-routine tasks in modular process plant

Felix Miesen, wissenschaftlicher Mitarbeiter an der Technische Universität Dresden

Changeable CPPS with high automation put new demands on operators. When human intervention is required, operators engage in problem solving, however, due to less chances to work with the CPPS, operators likely need assistance to do so. This talk summarizes 3 years of research on the design and evaluation of competency-promoting assistance in CPPS.

FREITAG, 12. Mai 2023, 13.00 Uhr

**Automated Trucks in Hub-to-Hub-Transport:
How should the future process look like?**

Svenja Escherle, wissenschaftliche Mitarbeiterin
am Lehrstuhl für Ergonomie

Truck drivers currently take on many more tasks than just the driving of the truck. So, what happens in the future when an automated truck arrives at the hub without a driver? How should the future process look like from an ergonomic perspective?

FREITAG, 12. Mai 2023, 13.45 Uhr

**Human-robot proxemics and perception in
different realities**

Olivia Herzog, wissenschaftliche Mitarbeiterin
am Lehrstuhl für Ergonomie

What makes us feel comfortable around different kinds of robots? In this talk results on the effects of the size and shape of a robot as well as results from VR, AR and lab experiments are presented.

FREITAG, 02. Juni 2023, 13.00 Uhr

**Analysis and modelling of interaction
between drivers and automated vehicles for
prospective assessment**

Tianyu Tang, wissenschaftliche Mitarbeiterin am
Lehrstuhl für Ergonomie

The advent of unsupervised automated driving marks a significant advancement for the automotive industry not only in terms of functionality, but also regarding validation. Even the most comprehensive road tests fail to statistically demonstrate the safety of autonomous vehicles. Thus, the employment of alternative validation methodologies becomes imperative. While prospective safety analyses present a promising solution, their effectiveness is limited by the shortcomings of current models.

FREITAG, 02. Juni 2023, 13.45 Uhr

**Human-Centered Explainable AI for user-
adaptive in-vehicle systems**

Julia Graefe, wissenschaftliche Mitarbeiterin am
Lehrstuhl für Ergonomie

This work investigates the approach of explainable AI for user-adaptive in-vehicle comfort and infotainment features from a user-centered point of view. This talk

will present the results of an online user study that was conducted to evaluate different explanation types for adaptive in-vehicle systems regarding the user's need for explanation, subjective satisfaction as well as the effectiveness of the explanations.

FREITAG, 30. Juni 2023, 13.00 Uhr

**Objective Evaluation of Thermal Comfort in
Highly Automated Vehicle Concepts**

Manuel Kipp, wissenschaftlicher Mitarbeiter am
Lehrstuhl für Ergonomie

The evaluation of thermal comfort in vehicles is mainly based on the subjective evaluation of application engineers. Subjective assessments are increasingly supported by objective measurements of the equivalent temperature. The presentation will address influencing factors and assessment methods to evaluate thermal comfort in highly automated vehicle concepts, including CFD-Simulations of cabin interiors. In addition, an outlook on energy saving concepts and optimized thermal comfort of climate systems is given.

FREITAG, 30. Juni 2023, 13.45 Uhr

**Crossing the Road while Interacting with an
Automated Vehicle: Behavior of Pedestrians
in a Group**

Maximilian Hübner, wissenschaftlicher
Mitarbeiter am Lehrstuhl für Ergonomie

The development of external human-machine interfaces (eHMIs) for automated vehicles has mostly focused on one-to-one scenarios. However, the increasing prevalence of pedestrians on roadways highlights the need to examine how these interfaces can handle more complex situations. In this talk, the findings of a virtual reality study will be presented that investigated how participants interacted with automated vehicles when accompanied by multiple pedestrians during road crossings. Furthermore, potential future studies will be discussed that could expand on these findings and contribute to the development of more effective eHMIs.

FREITAG, 30. Juni 2023, 14:30 Uhr

Mobile Robots on Sidewalks - Legal Context and Resulting Requirements

Marko Thiel, wissenschaftlicher Mitarbeiter am Institut für Technische Logistik, TUHH

Operating autonomous robots on sidewalks presents technical and legal challenges. We analyze Germany's legal framework and derive equipment and operational requirements, using a case study based on two robot prototypes. Our insights support mobile robot deployment and shaping future regulations.

FREITAG, 07. Juli 2023, 13.45 Uhr

Assessing AV Transparency

Yuan-Cheng Liu, wissenschaftlicher Mitarbeiter am Lehrstuhl für Ergonomie

We developed a transparency assessment method for the automated vehicle (AV) human-machine interface (HMI) in the previous study, where it was further validated in an online study. Later, we brought the proposed method to the driving simulator to validate it further in a higher-fidelity environment. We compared multiple psychophysiological measurements for workload with objective ones during the process transparency assessment method. Differences in transparency were found among different HMI designs.

FREITAG, 07. Juli 2023, 14:30 Uhr

Concept Ideas of Augmented Reality Human-Machine Interface Components in an eVTOL Aircraft

Dominik Janetzko, wissenschaftlicher Mitarbeiter am Lehrstuhl für Ergonomie

In this talk, first concept ideas for Human-Machine Interface components in an eVTOL aircraft will be presented. They represent the first iteration of an Augmented Reality Assistance system to support pilots during an eVTOL flight.

FREITAG, 14. Juli 2023, 13.00 Uhr

Long-term effects of automation on user behaviour

Naomi Y. Mbelekani, wissenschaftliche Mitarbeiterin am Lehrstuhl für Ergonomie

This presentation will provide listeners with an advanced understanding of strategies for improving knowledge discovery on the topic of long-term automation-induced effects on user behaviour. An overview of the study project will be illustrated as well as the procedure taken for our ongoing studies.

FREITAG, 14. Juli 2023, 13.45 Uhr

Experimentelle Studie zum Stehen und Gehen bei der Arbeit – Was ist kompatibel mit physiologischen Eigengesetzlichkeiten und menschlichen Bedürfnissen?

Lisa Rücker, wissenschaftliche Mitarbeiterin am Lehrstuhl für Ergonomie

In einer Studie mit zwei Szenarien wurden Steh-/Gehanteile sowie die Bewegungsdynamik variiert. Mit Hilfe der Elektromyographie wurden statische/dynamische Komponenten der Muskelbeanspruchung und die Muskelermüdung erfasst und mit Ergebnissen der Wasserplethysmographie sowie einer strukturierten Befragung verglichen.