Special Session Proposal

Motion Comfort in Automated Driving

Modality
1-2 Full days depending on the accepted papers (potential full paper submissions ~20)

Scope &
Automated vehicles (AVs) are considered one of the major technological developments in the automotive industry, able to enhance future mobility, by improving safety, environmental impact and accessibility. The ability to engage in non-driving tasks is considered by consumers one of the key reasons for AVs adoption leading to the requirement of higher comfort. However, AVs motion is expected to provoke motion sickness (MS) especially when users take their eyes off the road. These challenges need to be overcome before AVs become part of our daily life.

This special session organized by colleagues from academia and industry will align research and development on motion comfort in automated driving. The special session will consider papers on:

- Experimental evaluation and detection of perceived comfort including motion sickness,
- Theories and models predicting comfort,
- Detection and mitigation strategies (vehicle motion planning, control, interior modifications etc.) to enhance comfort and user acceptance in AVs.

Organizers
The special session is chaired and co-organized by the following:

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<th>Chairs</th>
<th>Co-organizers</th>
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| Dr. Georgios Papaioannou & Dr. Barys Shyrokau  
*Delft University of Technology, the Netherlands*  
g.papaioannou@tudelft.nl, b.shyrokau@tudelft.nl |
| Dr. Cyriel Diels (Royal College of Art, London, UK), Dr. Jan Souman (TNO, the Netherlands), Dr. Monica Jones (University of Michigan Transportation Research Institute, United States), Prof. Takahiro Wada (Nara Institute of Science and Technology, Japan) Prof. Riender Happee (Delft University of Technology, the Netherlands) |

Georgios Papaioannou received the Ph.D. degree from the National Technical University of Athens (NTUA), Greece, in 2019. He is currently an Assistant Professor at TU Delft, after conducting postdoctoral research at KTH Royal Institute of Technology, Sweden and
Cranfield University, U.K. His research interests include motion comfort, seat comfort, human body modelling, automated vehicles, optimisation and control.

Barys Shyroka received a joint PhD degree, 2015, in Control Engineering from Nanyang Technological University and Technical University Munich. He is an assistant professor in the Section of Intelligent Vehicles, Delft University of Technology, and his research interests are vehicle dynamics and control, motion comfort, and driving simulator technology. Scholarship and award holder of SAE, FISITA, DAAD, SINGA, ISTVS, and CADLM.

Cyriel Diels is the Deputy Director of the Intelligent Mobility Design Centre (IMDC) at the Royal College of Art leading research at the intersection of people, mobility and technology. He has a background in psychology and been working in the field of automotive and transport human factors and design in both academia and industry. In 2017, He was appointed as the Academic Director of the National Transport Design Centre (NTDC) establishing a portfolio of design-led projects promoting the uptake and acceptance of sustainable mobility solutions across transport modes. In 2018 he joined the RCA’s Intelligent Mobility Design Centre as Deputy Director. My research is funded by a wide range of organisations including Innovate-UK, European Commission, UK research councils, OEMs and Tier 1 suppliers.

Jan Souman is a senior scientist at TNO Integrated Vehicle Safety in Helmond, the Netherlands. His expertise is in the Human Factors of driving, with a focus on driving automation. Jan obtained his PhD from the University of Utrecht (NL) in 2005 on the topic of visual motion perception during eye movements. Since then, he investigated human-technology interaction in several domains (Virtual Reality, lighting, driving). Currently, his main research focus is on the impact of driving automation on the human driver. Part of his work is related to motion sickness, unravelling and modelling the different factors that contribute to motion sickness. In addition, he works on driver monitoring, aiming to predict and support driver situation awareness, especially for transition of control in automated vehicles.

Monica Jones has over 10 years of experience conducting research studies relating to humans in engineered systems. Motivated by eight years of practice as an industrial engineer in the automotive industry, Dr. Jones’ approach to research is solution-oriented and based on detailed, accurate quantification of human interactions with products and workspaces. Dr. Jones’ research spans human factors, vehicle occupant protection, engineering anthropometry, and human modeling for vehicle design and other areas of ergonomics, including consumer products and tools to facilitate the design of industrial workplaces. Dr. Jones has recent and current industry-sponsored projects focused on quantifying vehicle occupant behavior and/or response in automated vehicles (AVs). Quantifying occupant behavior, posture, state, and preferences will become an increasingly important problem as automation transforms drivers into passengers.

Takahiro Wada is a Full professor of Nara Institute of Science and Technology (NAIST). Dr. Wada earned his PhD degree in Robotics, from Ritsumeikan University, Japan in 1999. After spending 12 years at Kagawa University and 9 years at Ritsumeikan University, he has been a full professor and a director of Human Robotics Lab., NAIST since 2021. His current research interests include human-machine systems. In particular, he is interested in
understanding human performance in human–machine interaction, including motion sickness.

Riender Happee investigates the human interaction with automated vehicles focussing on motion comfort, acceptance and safety at the Delft University of Technology, the Netherlands, where he is full professor at the Faculty of Mechanical, Maritime and Materials Engineering. He investigated road safety and introduced biomechanical human models for impact and comfort at TNO Automotive (1992–2007) and received the M.Sc. degree in mechanical engineering and the Ph.D. degree from Delft University of Technology (TU Delft), The Netherlands, in 1986 and 1992, respectively.

Proposers' contact details
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