Thesis Work - Development of motion comfort & sickness prediction models and methods for AD

Thesis Worker at Volvo Cars
Welcome to explore the world of Volvo Cars by writing your thesis with us! As a thesis worker in our organization you are supported by a supervisor who follows you during your project. All thesis projects are arranged in business-critical areas and therefore you will be able to contribute to our company purpose – providing freedom to move in a safe, sustainable and personal way – from day one!

Scope
The task, for 2 students working together, is to create and develop human models and methods for analyzing the comfort feeling within Autonomous Drive (AD) using collected data. The test data will be collected from performed predefined test scenarios using IMUs on human body and test vehicle. The human models and methods, based on biomechanical theories and data analyses, will be used to identifying the comfort zone of AD/ADAS functions. Humans are sensitive to some specific range of oscillations which is specified in the ISO 2631-1:1997 standards. However, the standard is providing the limited weighting filters for calculation of motion dose for prediction of motion comfort & sickness. The standard needs to be re-visited to enhance the models for AD and may also be extended for more accurate 6 DoF human models (including vestibular system) which can be run in real-time. An important factor that affects the acceptance of autonomous driving is the capability of passengers to perform non-driving tasks like reading, relaxing, and/or socializing in a comfortable way with no or limited motion sickness/discomfort symptoms. Since “Comfort” is one of the main drivers for AD functions, the final aim of the project is to understand the customer expectations and draw the limits of the motion comfort & sickness.

Profile
We would like you to have studied and learnt Matlab/Simulink, biomechanics modelling, control theory, hands on measurement system experience, signal processing and system identification, applied estimation theory (Kalman filters etc.) Preferably you are, or make a good team in, Master’s degree students in Biomedical/Biomechanics Engineering in a combination with Systems, Control and Mechatronics Engineering.

Thesis work will need you to be at Volvo Cars site in Gothenburg for specific activities.

- Academic credits: equivalent to 30 ECTS
- Starting date: January 2021, to be discussed
- Estimated end date: Summer 2021
- This is a thesis work for 2 students (preferably) working together

How to Learn More and Apply
Selection will be ongoing during the application period, so do not hesitate to send in your application. Attach your resume and cover letter and copies of grades. You can provide a reference if you would like. Please note that due to GDPR applications by email will not be accepted.

If you have any additional questions regarding the position, you are welcome to contact:
Supervisor, Ilhan Yunus, ilhan.yunus@volvocars.com, +46734637344

We want your application at the latest 2020-12-06