



virtual  **vehicle**

VIRTUAL VEHICLE is a leading international R&D center for the automotive and rail industries. The center focuses on advanced virtualization of vehicle development. This linking of numerical simulations and hardware testing leads to a powerful HW-SW system design. About 300 people are now employed at our site in Graz - their expertise enables the efficient development of affordable, safe and environmentally friendly vehicles.

Master Thesis

“Thermal Modelling of the Human Body for the Application in Vehicle Cabin Comfort Control”

Ref.Nr. B_075

Bachelor-/Master Thesis

The aim of this thesis is to support the development of fully automatic human-centred comfort control systems in future vehicles. The goal is to implement a dynamic model of the heat transport in the human body as well as the autoregulation mechanisms of the body to adapt for changing thermal environments. This will provide the basis for the assessment of the local comfort perception in an online digital twin for the passengers of a vehicle. Therefore, the implemented model needs to be coupled not only to the thermal environment of the cabin, but also to suitable comfort models. The thermal body model will be calibrated and validated using measurement data generated with an advanced comfort dummy in climate test chamber. The focus of the thesis may be extended to adaptive control algorithms, to consider individual characteristics of specific passengers, or to the model order reduction of the resulting model, to achieve fast solutions for relevant application scenarios.

Your Tasks

- Literature research to suitable thermal body models.
- Model implementation preferably in Python or another language (Matlab/C++).
- Calibration and validation with measurement data, provided by a research project, the thesis is embedded in.
- Integration with existing models for the thermal environment and the human comfort perception.
- Investigation of model sensitivities and characteristic parameters for model adaptation to specific individuals.

What we expect from you

- Programming skills in Python or another higher programming language.
- Ongoing studies in mechanical engineering or similar
- Experiences in numerical modelling and mathematical understanding.
- Interest in thermal management and ideally in thermal comfort aspects.
- Motivation to work in a team and contribute to a bigger project.

What we offer

- Collaboration and contribution in an engaged, dynamic team.
- Interesting work in an international research center.
- **Paid** Thesis.
- Mentoring program for new employees.
- Diverse sports and health activities regularly.
- Corporate Events.

For technical questions please contact:

Sebastian Möller
+43-(0)316-873-9638

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Virtual Vehicle Research GmbH processes your application to manage your application. For further information please see our [Data Protection Notice](#).

If you consent that your submitted data is also stored in our talent pool for up to 1 year after the last contact with you, please let us know by E-mail. You may withdraw your consent at any time.

APPLY NOW and JOIN OUR TEAM

Contact: Barbara Cappello | +43 316 873 9028 | Inffeldgasse 21a, 8010 Graz | www.v2c2.at