

R&D SIMULATION ENGINEER - INTERNSHIP (M/F) VERSAILLES (78) FRANCE

Topic: Modelling the impact of breathing and sweating on fogging onset

ABOUT VEDECOM INSTITUTE

VEDECOM is a French Institute for Energy Transition (ITE) dedicated to carbon-free and sustainable mobility. The institute operates as partnership-based foundation, with over 40 members from the automotive, mobility, energy and aerospace industries, as well as academic and research institutions, backed by the French government and working in a pioneering collaborative manner. VEDECOM focuses on innovations in vehicle electrification, autonomous and connected mobility as well as shared energy.

ACTIVITIES

In charge of finding innovative solutions for reducing over-consumption caused by passenger compartment conditioning and improving the occupants' comfort and experience in electric vehicles, VERY-LOW-ENERGY AUXILIARIES AND ENERGY MANAGEMENT team is focusing its research efforts on the following topics:

- ✓ Development of coupled models (aero-thermal, radiative, physiological and psycho-sensory aspects of the passenger compartment and occupants) for the analysis or parametric study of passenger compartment thermal comfort.
- ✓ Experimental and numerical investigations to develop and test 'intelligent' driving configurations and strategies designed to deliver high energy efficient and customizable comfort adapted to new forms of mobility.
- ✓ Experimental research into the comfort experienced, supported by human tests in a controlled passenger compartment environment, and modelling.

For the purpose of this activity, our team is looking for a highly motivated student to work on the numerical approach using human thermo-physiology to estimate vapor production in car cabins and its impact on the fogging onset.

The goal of this work is to evaluate and validate modelling assumptions used in usual approaches against our physics-based modelling approach.

The internship is scheduled according to the following roadmap:

- ✓ Handle norms around the defogging systems.
- ✓ Handle the CFD tool Ansys Fluent.
- ✓ Handle modelling of fluid dynamics and species transport with CFD.
- ✓ Handle heat transfer modelling using a thermal software.
- ✓ Handle vapor production modelling by humans using a thermo-physiological model.
- ✓ Handle vapor condensation model on windows.
- ✓ Perform standalone CFD simulations.
- ✓ Perform coupled simulations (between thermal/thermo-physiological and CFD).
- ✓ Analyse results.

Keywords : heat transfer, CFD, numerical simulation, fogging

REQUIREMENTS

Education:

- Enrolled in a university pursuing an undergraduate or master's degree in Aerospace, Mechanical Engineering, Computer Science or a related field

Technical skills:

- Solid background knowledge of fluid mechanics and convective heat transfer

- Knowledges in thermal comfort and thermo-physiology or previous working experiences on these topics (internship or projects) are welcome.
- Mastering a programming language (Python ideally) and demonstrating strong scripting skills

Personal skills:

- Being a good team player
- Very good analytical and synthesis skills
- High interest for the topic and high level of motivation for the mission
- Willing to bring your own contribution to the project

If you are interested, please send your CV, motivation letter to ilango.thiagalingam@vedecom.fr

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Remuneration: 700 € gross/month	Start: June 2021
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