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Dissertation

VIRTUAL VEHICLE develops innovative solutions for future mobility - with a unique combination of simulation technology and real vehicle testing. Our focus lies on the optimisation of test and validation processes in the automotive and rail industries - with an increasing focus on future-oriented domains such as energy, maritime, defence and health tech. In close cooperation with industry, research and science, we bring new technologies into direct application. With over 300 employees, we are not only a key driver of innovation, but also a place for brilliant minds who really want to make a difference.

Siemens Healthineers, based in Erlangen/DE (subsidiary in Kemnath), is a manufacturer of medical technology. The focus of de-velopment and sales is on products for imaging diagnostics and therapy, products for in-vitro diagnostics, as well as services in medical technology.

This **cooperative PhD project** is carried out in collaboration with Siemens Healthineers. The majority of the research activities will take place at Virtual Vehicle in **Graz**, while a smaller portion of the working time is planned to be spent on-site at the partner company in Kemnath.

Dissertation - „CAE protection cable harness"

As part of an industrial research project, a closed-loop CAE approach for the virtual protection of cable harnesses is being developed with the aim of carrying out simulation-

based mechanical, electrical and thermal protection of cable harnesses in the environment of medical devices.

Tasks

Mechanical protection (main focus of the work):

- Development of an elastic MBS model (multi-body simulation) from the CAD model of a cable harness (homogenisation of individual cables).

- Development and validation of efficient methods for model parameterisation based on component tests.

- Calculation of the mechanical critically loaded cable areas.

- Development of an FE model for a cable segment with homogenised cores to calculate the mechanical loads within a cable segment.

- Estimation of service life based on stresses and number of load cycles.

- Validation through physical tests and ML-based image analysis of cable movements.

Electrical & thermal protection (additional):

- Research and evaluation of existing tools and methods.

- Analysis of power and signal integrity using suitable simulation methods (e.g. SPICE simulations).

- Evaluation of the electrical-thermal behaviour under the influence of environmental factors (heat input from nearby aggressors).

- Identification of the limits of existing simulation approaches.

- Working on typical scenarios, e.g. current surge with falling fuse.

Your Profile

- Degree (diploma/master's degree) in electrical engineering, mechatronics, mechanical engineering, physics or similar.

- Knowledge of finite element methods (FEM) or multi-body simulation (MBS).

- Experience with CAE tools (e.g. RecurDyn, Abaqus etc.)

- First contact with SPICE or electrical network simulation is an advantage.

- Interest in AI/ML methods for image or motion analysis.

- Analytical thinking, independent working style and ability to work in a team.

We offer

- Dissertation on a permanent contract of employment.

- Qualified support in close cooperation with an industrial partner and a university.

- Access to state-of-the-art CAE infrastructure and real wire harness data.

- Possibility to apply the results in real development projects of the industrial partner in the field of medical technology.

- Opportunity to publish in scientific journals and conferences.

- Varied and versatile tasks in an international research center.

- An exciting and interdisciplinary working environment with a lot of creative freedom.

- Freedom for responsibility and creative collaboration.

- Home office models and flexible time management.

- Company events as well as balancing sports and health promotion measures.

APPLY NOW and JOIN OUR TEAM

Contact

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