Large Engines Competence Center

Shaping the Future for SustainableTechnologies

The Large Engines Competence Center (LEC) is one of the world's leading research institutions in the field of sustainable transport and energy systems and offers excellent career prospects in a scientific environment of the highest quality. The cooperation with world-leading industrial partners and renowned research institutions allows application-oriented top-level research with the aim of preserving an environment worth living in for future generations.

Paid Master thesis

Integration of machine learning methods into numerical simulation

Field of study:
Mathematics, Physics, Informatics, Telematics or similar scientific subjects

Target

The combination of common physics-based methods with data-driven models to so-called hybrid approaches is a current topic in the field of numerical simulation. Since hybrid models show great potential to increase prediction accuracy compared to standard data-driven methods and/or accelerate physics-based numerical simulation, the idea of this approach is to combine the benefits of both worlds.

In the frame of this Master thesis, a novel method which directly integrates machine learning methods into the numerical scheme used for solving partial differential equations shall be elaborated. Therefore, an existing baseline concept shall be further developed and its application to more complex physical problems shall be investigated.

Tasks

- Literature research
- Familiarization with the existing concept and coding framework
- Generalization of the concept to enable the usage on different partial differential equations
- Application on several physical problems, validation and plausibility check of results
- Writing of master thesis

Target group

Master students of Mathematics, Physics, Informatics, Telematics or similar scientific subjects

Possible start: any time
Duration: 6 months

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Become part of our successful LEC team!

We are looking forward to your application.

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