HDSLEE | HELMHOLTZ SCHOOL FOR DATA SCIENCE IN LIFE | EARTH | ENERGY

PhD project: Process-Inspired Data Acquisition for Autonomous Ice Exploration Robots on Earth and Beyond

The Helmholtz School for Data Science in Life, Earth and Energy (HDS-LEE) provides an interdisciplinary environment for educating the next generation of data scientists in close contact to domain-specific knowledge and research. All three domains – life & medical sciences, earth sciences, and energy systems/materials – are characterized by the generation of huge heterogeneously structured data sets, which have to be evaluated in order to obtain a holistic understanding of very complex systems.

Project overview

Autonomous exploration technologies such as UAVs (unmanned aerial vehicles) or AUVs (autonomous underwater vehicles) are on the rise in the earth sciences. They are used for mapping the environment or characterizing its physical, chemical or biological properties. Since recently, autonomous exploration technologies are also developed for cryospheric applications, e.g. in the form of heated robots that melt their way through the ice. Typical research objectives are to investigate subglacial ecosystems. Yet, there is an urgent need to develop methods that enable us to interpret the acquired data in light of the complex physical processes in the melt channel, and thereby to improve the knowledge return of this data.

Your profile

We are looking for a candidate with a background in computational geosciences / geophysics / geophysical fluids dynamics / environmental engineering, or alternatively with a background in computational engineering science / applied mathematics / scientific computing and strong interest in the geoscientific research (that should be motivated in the application). Experience in coding and with large scientific software is a definite plus.

- a completed master's degree in mathematics, computer science, natural sciences or engineering
- TOEFL or equivalent evidence of English-speaking skills
- a high level of scholarship as indicated, for example, by bachelor and master study transcripts and two reference letters
- good programming skills, e.g. experience with any of the following would be a plus: Python, C++
- excellent communication and organizational skills

Our offer

The PhD project will be located at the Aachen Institute for Advanced Study in Computational Engineering Science (AICES). The candidate is jointly supervised by Prof. Stefanie Elgeti (Chair for Computational Analysis of Technical Systems, elgeti@cats.rwth-aachen.de) and Priv.-Doz. Dr. Julia Kowalski (Geofluiddynamics, kowalski@aices.rwth-aachen.de). We offer

- 3 year position with a salary amounting to TVL 13 100%.
- program at the graduated school with comprehensive training courses, e.g. in parallel computing, machine learning and deep learning, visualization, and scientific computing
- PhD students are encouraged to attend international conferences and can be selected for a period to stay abroad

Apply to and contact for further information: Priv.-Doz. Dr. Julia Kowalski kowalski@aices.rwth-aachen.de

Apply until: 31th May 2019

Starting date: 1st July 2019