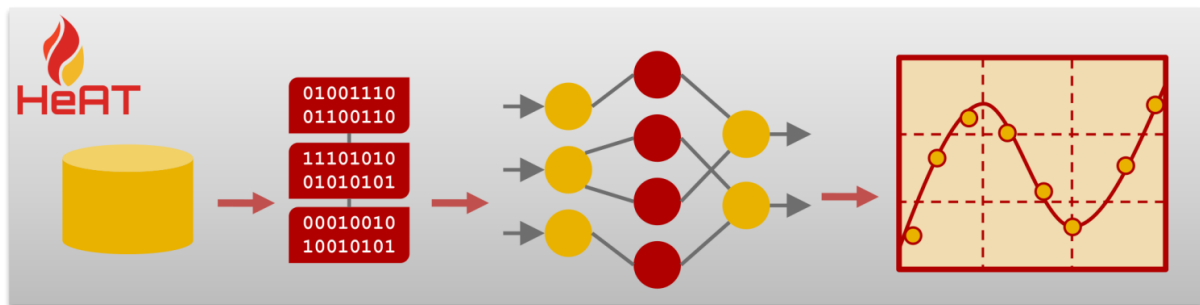


## PhD project “Uncertainty Estimation of Deep Neural Network Predictions”

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. Visit HDS-LEE at: [www.hds-lee.de](http://www.hds-lee.de)

### Project overview

We are looking for a PhD-student (f/m) in data sciences to work within a project linked to the “Helmholtz School for Data Science in Life, Earth and Energy (HDS-LEE)”. The successful candidate will investigate uncertainty estimation of deep neural networks and demonstrate their applicability for safety critical systems, which typically require a certification process.



### Your Job:

- Analyze and understand methods to estimate uncertainties in deep neural networks.
- Improve current methods of Bayesian based deep learning.
- Implement distributed deep learning algorithms with uncertainty estimation into the machine learning framework HeAT.
- Demonstrate how uncertainty estimation of deep neural networks can improve the safety of critical systems, such as self-driving cars or rocket engines

### Your Profile

- University degree in either computational engineering science, computer science, applied mathematics, data sciences, simulation sciences, or physics
- Good experience in machine learning theory
- Good Programming skills in Python and C++
- Experience with stochastic processes, Monte Carlo methods, or uncertainty analysis is advantageous.
- Good experience with parallel computing is a clear advantage.
- Experience with deep learning frameworks, such as Tensorflow or Pytorch is advantageous.
- Ability to work independently as well as collaboratively in an international, interdisciplinary team; good communication and organizational skills
- Very good command of the English language: 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

## Our Offer

This HDS-LEE PhD position will be located at the German Aerospace Center (DLR) in the “Simulation and Software Technology” group. The candidate will be supervised by Prof. Achim Basermann.

### We offer

- 3 year position
- Pay in line with 100 % of pay group 13 of the Collective Agreement for the Public Service (TVöD)
- Unique HDS-LEE graduate school program
- A highly motivated group as well as an international and interdisciplinary working environment at one of Europe’s largest research establishments
- Outstanding scientific and technical infrastructure – ideal conditions for successfully completing a doctoral degree
- Chance of participating in (international) conferences
- Continuous scientific mentoring by your scientific advisor
- Doctoral degree conferred by University of Cologne
- Further development of your personal strengths, e.g. via a comprehensive further training programme

Further information on HDS-LEE is available at: [www.hds-lee.de](http://www.hds-lee.de)

Become a part of HDS-LEE.

Apply to and contact for further information: Dr.-Ing. Achim Basermann [Achim.Basermann@dlr.de](mailto:Achim.Basermann@dlr.de)

Apply until: 30<sup>th</sup> June 2019

Starting date: 1<sup>st</sup> August 2019