

Bachelor Thesis

Uncertainty quantification of deep neural networks

Collaborate within an international team with strong ties to the German Aerospace Center and contribute to the development of next-generation AI models for the advanced analysis of remote sensing imagery, making contributions with real-world applications to the sustainable development goals, climate change, and natural hazards.

Background

(Deep) neural networks are very successful machine learning approaches. However, they tend to provide overconfident predictions, i.e. wrong predictions are made with similar confidence levels as correct predictions. This is a considerable disadvantage in many applications.

Project

The goal of this thesis is to design and implement an approach to transform model uncertainties into uncertainties of the predictions. This shall be done in the context of semantic segmentation.

Expected outcome

- Literature research on existing uncertainty quantification frameworks
- Implementation of an approach for uncertainty quantification
- Evaluation of the approach on benchmarks, comparison with relevant reference methods

Your Profile

- Scientific curiosity, very good ability to work independently, strong communication skills
- High motivation to deeply explore a given research topic
- Background in computer vision and/or machine learning
- Strong programming skills (python)
- Knowledge in remote sensing is not required

Contact

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Please feel free to reach out for more topics e.g. on Machine Learning, Deep Learning, Ensemble Learning, Computer Vision, Remote Sensing, Earth Observation, Synthetic Aperture Radar or regarding the option to conduct your Master thesis at the DLR in Oberpfaffenhofen.