



# BOSCH

## Master Thesis Data Augmentation for Neural Processes

Robert-Bosch-Campus 1, 71272 Renningen, Germany

Full-time

Legal Entity: Robert Bosch GmbH

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### Company Description

**Do you want beneficial technologies being shaped by your ideas? Whether in the areas of mobility solutions, consumer goods, industrial technology or energy and building technology – with us, you will have the chance to improve quality of life all across the globe. Welcome to Bosch.**

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### Job Description

Neural Processes (NPs) are a well-established neural network-based model family for probabilistic regression. They are particularly well-suited for transfer learning settings as they automatically learn to exploit structure shared between multiple instances ("tasks") of a given family of regression problems while being efficient to train and evaluate. However, NPs usually require a relatively large amount of training tasks which limits their applicability in practice. In this master thesis we aim to extend NPs to the regime of few training tasks via data augmentation.

- You support us at the review of the state-of-the-art (transfer learning methods for probabilistic regression, approaches for data augmentation).
- During your assignment you are responsible for comparison of NPs with existing methods with focus on settings with few training tasks.
- Take an active role in development of a data augmentation framework to improve NP's performance with few training tasks.
- Furthermore you will evaluate the method.

### Qualifications

- **Education:** studies in the field of computer science, physics, maths or comparable
- **Personality and Working Practice:** open-minded, team-player and self-motivated
- **Experience and Knowledge:** experience with basic machine learning techniques (e.g. inference in latent variable models, stochastic/Gaussian processes, deep learning), knowledge of Python and PyTorch
- **Languages:** fluent in English

### Additional Information

**Start:** according to prior agreement

**Duration:** 6 months

Requirement for this thesis is the enrollment at university. Please attach a motivation letter, your CV, transcript of records, examination regulations and if indicated a valid work and residence permit.

### Need further information about the job?

Michael Volpp (Business Department)

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