

The bioinformatics research lab at the Technical University of Munich, TUM Campus Straubing for Biotechnology and Sustainability and Weihenstephan-Triesdorf University of Applied Sciences is looking for a candidate for a Bachelor's or Master's thesis with the topic

## Evaluation of modern probabilistic Time Series Forecasting approaches for sales of small and medium-sized companies

at the earliest possible date.

Predicting the future based on historical observations is a common problem in many areas. Probabilistic methods provide several advantages for this purposes, but modern approaches are usually based on large datasets. These are often not available in small and medium-sized companies. The goal of this thesis is to evaluate whether they are nevertheless applicable for horticultural sales predictions based on datasets provided by partner companies.

### Your tasks:

- Literature research on modern probabilistic Time Series Forecasting approaches. Potential algorithms are the following ones:
  - o DeepAR <https://arxiv.org/abs/1704.04110>
  - o ARMDN <https://arxiv.org/abs/1803.03800>
  - o Deep State Space Models  
<https://papers.nips.cc/paper/2018/hash/5cf68969fb67aa6082363a6d4e6468e2-Abstract.html>
- Analysis of datasets provided by partner companies
- Implementation of three modern probabilistic approaches
- Application of already implemented Time Series Forecasting methods
- Visualization and interpretation of the results based on a comparison of all techniques you used

### Your skills:

- You are close to finishing your Bachelor's or Master's degree, preferably in a technical field
- Good programming knowledge, preferably in Python
- Very Good programming skills are an advantage
- Profound knowledge of statistics and good mathematical skills
- First experience with statistical models and machine learning are a plus
- Strong motivation and interest for computer science and machine learning
- Ability to work and learn new topics autonomously
- Proactive, goal-oriented and communicative way of working
- Good language competence in English, written as well as spoken