

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

Machine Learning for Sales Prediction of an Online Trader

at the earliest possible date.

This thesis will be done in cooperation with an online trader who is selling his products on several platforms. Predicting the future based on historical observations is a common problem in many areas. For this purpose, modern statistical and machine learning based methods for Time Series Prediction are widely applied. Sales of an online trader are usually influenced by various factors, such as regional events. Thus, the goal is to integrate prior knowledge in order to guide the analysis and decision-making. There are various applications for Time Series Prediction and in this thesis the focus will be on sales prediction of an online trader by using statistical methods, such as ARIMA and Exponential Smoothing.

After a thorough literature research, you will conduct data analysis to gain first insights on the structure and properties of the dataset, which is provided by an online trader. Afterwards you will focus on the implementation of statistical and machine learning based methods, such as ARIMA and Exponential Smoothing, its multivariate extensions or modern machine learning based methods. Furthermore, you will do research regarding external factors that might influence sales. Finally, your implementations will be used to train and evaluate models for the prediction of future sales.

Your tasks:

- Literature research on (multivariate) time series forecasting with a focus on sales prediction
- Data analysis and visualization of provided dataset
- Implementation of statistical and machine learning based methods, such as ARIMA and Exponential Smoothing and its multivariate extensions
- Research on external factors influencing sales
- Training and evaluation of sales prediction models

Your skills:

- You are close to finishing your Master's degree, preferably in a technical field
- Basic programming knowledge, preferably in Python
- Good programming skills are an advantage
- Basic 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