MASTERTHESIS MACHINE LEARNING-ENHANCED DEMAND PREDICTION FOR CERTAIN PRODUCT PORTFOLIOS WITHIN HILTI (M/F/D)

Kaufering near Munich

What's the topic?

As the current industry practice, Hilti Deutschland Logistik GmbH utilizes statistical models to aid with the demand prediction of selected product portfolios. Although these statistical models perform well on standard portfolios, it is especially challenging to forecast non-standard portfolios.

A promising approach is the application of machine learning (ML) methods to time series forecasting. The goal of this thesis is to benchmark successfully implemented ML approaches for time series forecasting and to provide a proof-of-concept for the practical application of ML in forecasting. Firstly, understanding the Hilti specific portfolio characteristics is crucial to derive desired characteristics of the potential ML forecasting algorithms. Secondly, the different portfolio needs are taken into consideration. Overall, the thesis will provide guidance on which methods work best for which portfolio and quantify the improvement upon the existing industrial practice based on the currently implemented statistical models at Hilti. Potential KPIs for benchmarking could be forecasting bias and forecasting accuracy, among others. The student will be asked to reason which prerequisites are needed to apply the ML-based forecasting models in practice. Finally, the student will work on actively including business knowledge on, e.g., material master data such as predecessor or successor materials, into the ML-based forecasting approach. The influence of this knowledge on the forecasting KPIs will be evaluated.

To this end, this thesis comprises of the following steps:

* Literature review on time series forecasting algorithms with a special focus on ML methods
* Implementation of promising ML-based forecasting algorithms in suitable programming language (e.g., Python, C++, C)
* Benchmarking of the newly developed approach to current industrial practice at Hilti based on suitable benchmark KPIs
* Integration of business knowledge into the developed ML-based time series forecasting pipeline

Who is Hilti?

Hilti is the place where innovation is harnessed to improve productivity, safety, and sustainability in the global construction industry and beyond. It's where solutions are born based on strong customer relationships, making it possible to build a better future. It's where 34,000 people across 120 different locations worldwide take pride in being part of the team. It's where people have the opportunity to explore their possibilities, unleash their potential, take responsibility for their personal development, and build their careers for the long term.

What you need is:

We are looking for a highly talented and motivated student to support our Demand Planning Team. That is why, you need…

☐ to have a particular interest in Operations & Supply Chain Management (OSCM) and participated in several lectures and seminars within this field

☐ to be a very organized person and a good team player

☐ to have strong analytical and problem-solving skills

☐ to have excellent communication skills

☐ to have good command of English & German

APPLICATION

In case you are interested please contact: lehre.bais@mgt.tum.de