

At the Chair of Logistics and Supply Chain Management of TUM School of Management, we are looking for an interested and qualified student to conduct his/her

Master thesis

on the topic

Generative Transformers for Cold-Start Forecasting: A Study in New Product Sales Predictions

Forecasting sales for new products is a significant challenge for firms because no historical sales data exists—a situation known as the “cold start” problem. Traditional statistical models often fail in this context due to their strong reliance on historical data. Recent advancements in generative transformer architectures (e.g., GPT-based models) offer new possibilities to overcome these limitations. By leveraging alternative data sources—such as product descriptions, online reviews, competitor information, and broader market trends—these models can potentially generate meaningful predictions even in cold-start scenarios. This thesis aims to investigate the application of generative transformers for forecasting new product sales and to benchmark their performance against traditional forecasting approaches.

Key project tasks:

- Literature review on Cold-start forecasting challenges, Generative transformer models applied to time series and structured data tasks
- Identify and collect relevant datasets
- Develop and implement generative transformer architectures to: Create predictive representations from textual and metadata inputs, Forecast sales for new products in cold-start situations
- Compare the predictive performance of generative transformer models with traditional forecasting methods
- Analysis of results and implications

Requirements:

The thesis is suitable for Master in Management and Technology students with a major in operations and supply chain management. The ability to work independently, as well as analytical skills are required. Strong interest in machine learning and solid programming skills, preferably in Python is required. Experience with deep learning frameworks (e.g., PyTorch, TensorFlow) and Knowledge of natural language processing or time series forecasting is a plus.

Earliest begin: as soon as possible

Supervisor: Mahsa Nakhost

Application: Email with curriculum vitae and transcript of records to logtheses.log@mgt.tum.de