

MACHINE LEARNING FOR SUPPLY CHAIN OPTIMIZATION

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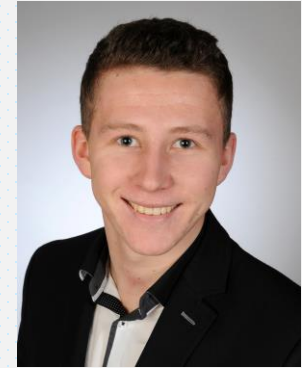
PEOPLE



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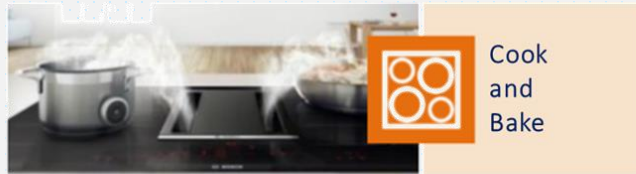
PURPOSE

In this project, you will

- Use a python-based **discrete-event simulation tool** developed by Camelot to model a **digital twin** of a Supply Chain with limited complexity
- **Create mass data** based on this simulation **using a parameter-driven inventory management model** with different parameter settings
- Develop a **machine learning algorithm to improve the inventory model parametrization**, leading to optimized inventory levels and customer service
- **Apply** the ML algorithm to real customer data (anonymized)

Real-world use case

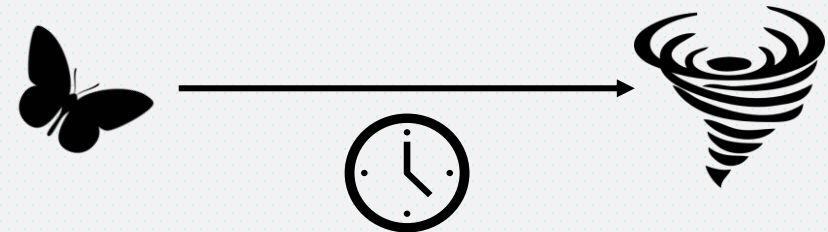
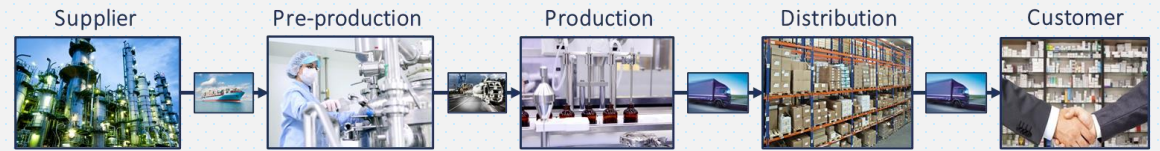
Companies like BSH have the need for machine learning algorithm to improve the inventory model parametrization



Digital Twin

The digital twin simulation allows to

- Easily analyze complex, multi-stage supply chain dynamics
- Capture the impact of time-dependent effects



- Define run
- Warehouse analysis
- Production analysis
- Daily planning
- Result comparison
- Run overview
- Network impact
- Location-product details
- Event impact analysis

Base run settings

Select run

Base run

Comparison run settings

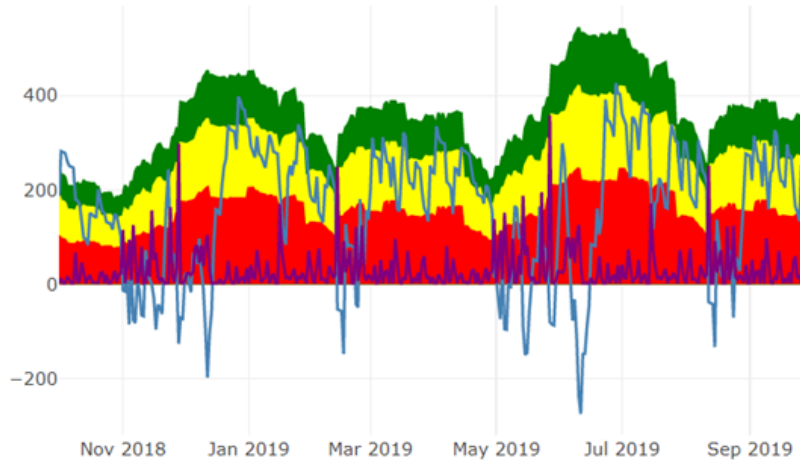
Select run

Forecast based ADU

Analysis settings & filters

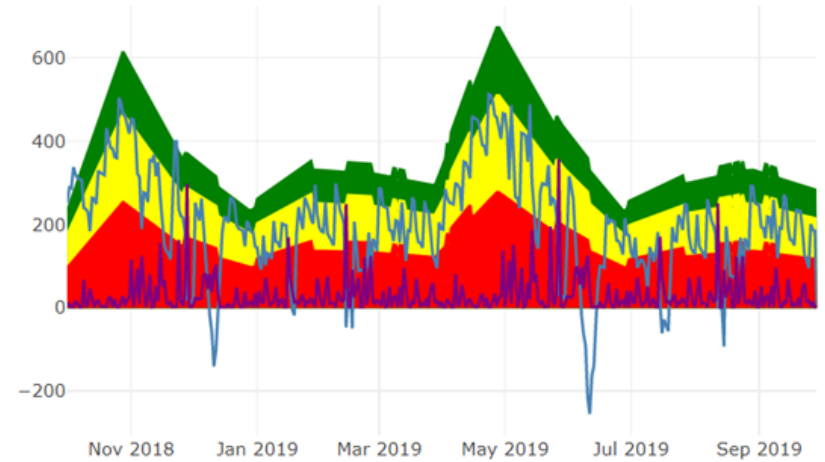


Base run - Planning View



Green zone Yellow zone Red zone
Inventory on-hand Demand

Comparison Run - Planning View



Green zone Yellow zone Red zone
Inventory on-hand Demand

Base Run - Inventory



Comparison Run - Inventory



FACT SHEET

- **Project title: “Machine Learning for Supply Chain Optimization”**
- **Contact: ralph.alexander.beier@uni-mannheim.de**
- **Language: German / English as required**
- **Duration: 1 semester**
- **Participants: 3-5**
- **Requirements:**
 - **Intermediate programming skills in Python**
 - **Machine Learning skills [ideally: successful participation in relevant courses such as IE 675 / IE 694 / CS 704]**
 - **Bonus: familiar with the basics of Supply Chain Management [e.g., participation in courses such as OPM 501 / OPM 502 / OPM 561]**
- **Suitable for MMDS: Yes**
- **Online: Yes**