

THOMAS LAUTENSCHLÄGER

Master of Science in Computer Science

@ th.la@me.com

📧 thlautenschlaeger.github.io

in linkedin.com/in/thlautenschlaeger

📄 github.com/thlautenschlaeger

EXPERIENCE

Software Developer / ML Scientist / ML Engineer

Self Employed

📅 Aug 2022 – Present

📍 Darmstadt, Germany

- Developed a software stack for real-time streaming data analysis for a major German energy provider using Python.
- Possess experience working with large-scale, multinational corporations.
- Facilitated cross-functional development between various teams.
- Assisted in making business-oriented decisions regarding software stack selections.

Machine Learning Scientist / Quant Analyst

Inkubator 100 Plus GmbH & Co. KG

📅 Feb 2021 – Present

📍 Darmstadt, Germany

- Designed investment algorithm strategies and applied machine learning techniques to stock market analysis.
- Conducted strategy testing and trade performance evaluation.
- Performed time series analysis using *statsmodels* and *PyTorch*, and researched and applied *PyTorch*-based probabilistic non-linear gradient solvers for risk minimization.
- Implemented a hypothesis testing framework with *sklearn* and *scipy* and developed a *Django*-based web dashboard for visualization of tested hypotheses and backtests.

Machine Learning Engineer

Inkubator 100 Plus GmbH & Co. KG

📅 Feb 2020 – Feb 2021

📍 Darmstadt, Germany

- Developed financial data processing algorithm pipelines and designed data processing and visualization architectures within a team.
- Implemented backtesting software and utilized *NumPy* and *Pandas* for comprehensive data management.
- Constructed a relational and multi-dimensional data lake with *PostgreSQL* and *MongoDB*, handling both raw and processed data.
- Integrated *CI/CD* with *Github* actions for automation and established a *Docker*-based containerized deployment environment.
- Facilitated data lake communication via *FastAPI*'s REST API and developed a *Django*-based application for executing and evaluating stock trades.

Student Research Assistant

TU Darmstadt - Laboratory of Lighting Technology

📅 Aug 2018 – Oct 2019

📍 Darmstadt, Germany

- Developed a light setting controller via non-linear optimization research using *TensorFlow* and *Python*.
- Gained research lab experience and insight into corporate operational differences.
- Implemented cutting-edge pupil detection algorithms for live tracking systems with *C++*.
- Integrated deep learning algorithms into a *MATLAB*-based user-interface tool.

System Administrator & DevOps

Appschmiede

📅 Jul 2016 – Aug 2018

📍 Darmstadt, Germany

- Established the company's IT infrastructure.
- Implemented automated backup plans, failover networks, and a new firewall system.
- Designed and implemented the backend and data streaming pipeline (using *MQTT*) for a bicycle riding event.

PROJECTS

Electrical Grid Monitoring and Data Analysis

- Designed and implemented an automated real-time electrical grid monitoring software in *Python*.
- Scaled the system utilizing a *Kubernetes* cluster.
- Developed pre-detection grid failure algorithms.
- Integrated *Azure* cloud functionalities.

Autonomous trading bot

- Developed a live trading bot software that autonomously operates in the market.
- Designed risk management algorithms using a non-linear gradient solver in *PyTorch*.

Burrolib: A Markov game framework

- Designed and developed a framework for simulating multi-agent Markov games.
- Established an interface within the agents for the integration of learning algorithms, such as reinforcement learning (RL) algorithms.
- Integrated fundamental reinforcement learning (RL) algorithms using *PyTorch*.

Reinforcement learning project

- Implemented and evaluated recent reinforcement learning (RL) algorithms on actual hardware using *PyTorch*.
- Engaged with Quanser environments, including Furuta pendulum, cart-pole, and more.

Twitter sentiment analyzer

- Implemented a real-time sentiment analysis on Twitter for given hashtags.

Crypto market anomaly detection

- Anomaly detection on crypto assets in real-time (deep learning algorithms in *Tensorflow*).
- Implemented a complete ETL pipeline with additional notification functionality.

Stock market analysis evaluator

- Market and individual stock risk evaluation. (*PyTorch*)
- Implemented several model learning and inference technologies for stock markets.
- Model testing and deployment with google cloud services.
- Setup of the infrastructure with terraform on google cloud.

EDUCATION

M.Sc, Computer Science

TU Darmstadt

📅 April 2018 – September 2020

- **Master thesis** - Variational Inference for Switching Dynamics
 - Identification and control of switching dynamics
 - Derivation and implementation of Bayesian rARHMMs
 - Integration of rARHMMs to *reinforcement learning*
- **Focusing courses**
 - Reinforcement learning
 - Optimization of static and dynamic systems
 - Statistical machine learning

B.Sc, Computer Science

TU Darmstadt

📅 April 2013 – Feb 2017

- **Bachelor thesis** - Darknet Crawling and Data Analysis
 - Extraction and analysis of market data to databases. (scrapy)