Lukas Bierling

Amsterdam | bierling.lukas@gmail.com | +4915233896998 | lukas-bierling.me | linkedin.com/lukas-bierling
github.com/Coluding

Projects

GNN-Based Optimization of Data Center Positions in Stochastic Environments

- Developed a novel approach combining GNNs to model spatial dependencies and RL for dynamic decision-making, optimizing global data center placement under stochastic and dynamic client demands. This method improved computational efficiency, scalability, and response times.
- Preparing a research paper to document findings; code available: github.com/Coluding/gnn-based-rl-location-optimization

Transformer-based Financial NLP Model

- Designed and implemented domain-specific transformer architectures specific for financial text analysis, incorporating reversible layers and customized attention mechanisms to enhance computational efficiency and model accuracy. This work forms the basis of a paper on efficient finance-specific document encoders, currently in progress.
- Code and further details available: github.com/Coluding/Assessing-Efficiency-in-Domain-Specific-Transformer-Models

Object Detection Pipeline

- Developed a novel object detection model focused on identifying center points of objects in satellite imagery, utilizing advanced deep learning techniques. Integrated a second-stage classifier to reduce false positives by 64%, significantly improving model precision and reliability.
- Impact: Enabled the client to leverage satellite imagery and as a new data source. Responsibilities included data preprocessing, model training and evaluation, postprocessing, and developing a full-stack application for seamless integration.

All other projects can be found here: lukas-bierling.me/projects

Education

University of Amsterdam, MS in Artificial Intelligence — Sept 2024 – today

- Grade: 8.75/10 (cum laude)
- **Coursework:** Computer Vision, Deep Learning, Machine Learning, Natural Language Processing

Fernuniversität Hagen, BS in Mathematics — April 2023 – today

- Grade: 2.7/4
- **Coursework:** Real Analysis, Linear Algebra, Convex and non convex optimizationn

University of Passau, BS in Information Systems — April 2022 – August 2024

- Grade: 3.7/4

University of Passau, BS in Economics Science — October 2020 – March 2024

- Grade: 3.7/4

Experience

Research Assistant NLP, University of Passau — March 2024 – now

- Research assistant for self-supervised pretaining of domain-specific language encoder models. Built pretaining pipelines and developed a modular domain-specific pretaining parameter tuning framework.
- More details: github.com/Coluding/language_models

Machine Learning Engineer, KPMG Munich — April 2022 – now

- Built customized center point based object detection and segmentation model from scratch for satellite images.

Invented an second stage classifier that reduced false positives to 34%. Main tools were Python, Pytorch and the Azure cloud.

- Developed a full stack application with React and FastAPI incorporating the results from the object detection.
- Contributing developer to internal LLM based RAG system based on Quart and React.

Financial Mathematics Intern, PwC Frankfurt am Main September 2021 – April 2022

- Developed and implemented advanced statistical models to evaluate complex financial instruments, including options, swaptions, rainbow options, and FX-swaps
- Leveraged data-driven techniques to enhance market and liquidity risk assessments, improving predictive accuracy and robustness.
- Designed and optimized a Python-based computational framework for large-scale mark-to-market valuation, reducing computational overhead by 40% and enabling scalable analyses.

Technologies

Languages: Python, C++, Java, Typescript

Frameworks and Technologies: Pytorch, Jax, Azure, Google Cloud, Docker, Kubernetes, FastAPI, React, Flask