

Specialized engineer, focused on numerical computation, optimization, and artificial intelligence (AI). Significant experience in the application of numerical methods and optimization. Growing AI expertise through industrial role and academic pursuits, including a JKU master's program and a Stanford University professional course, with a goal of leveraging acquired skills to develop innovative solutions in complex industrial contexts.

EXPERIENCE

AI/ML Lead Engineer - BMW Group

11/2024 - Present

Predictive Maintenance:

Munich, Germany

- Member of BMW's task force as an AI Expert for the Continental Braking System recall ([link](#)). Developed and implemented multiple AI models to analyze diverse data types: time-series curves, audio recordings, and image datasets. Achieved 91% accuracy in detecting faulty brakes, contributing to improved diagnostic efficiency.

Natural Language Processing (NLP) for Multilingual Damage Classification & Large Language Models (LLM):

- Extended NLP models from 512 to 4096 tokens and implemented a sliding-window approach to process >10k tokens, improving long-document understanding.
- Operationalized the solution, enabling cross-team independent deployment and usage.
- Operationalized the previously fine-tuned GPT-2, deploying it across multiple countries to match German market support standards.

Management & Leadership:

- Managing a 500k € annual budget for strategic AI initiatives, model training, and cloud services.

AI/ML Specialist - BMW Group

01/2022 - 11/2024

AWS ETL Pipeline for Customer Data to Enhance Design Quality:

Munich, Germany

- Designed and implemented an ETL pipeline on Amazon Web Services (AWS) to analyze customer data, including Personally Identifiable Information (PII) data, detecting optimization areas for BMW powertrain. Processed 350+ parameters from 200,000 vehicles, with projected deployment across 3 million vehicles. AWS services used include: S3, Glue, QuickSight and Athena for data storage, transformation, analysis, and visualization.

Predictive Maintenance:

- Developed and deployed deep learning models based on PyTorch for predictive maintenance, reducing vehicle recalls by 30%.
- Applied machine learning techniques such as time-series analysis using Pandas and anomaly detection using Scikit-learn.
- Member of BMW taskforce as AI Expert for ZF 8HP recall ([link](#)). Recall cost saving > 10 millions €.

Natural Language Processing (NLP) for Multilingual Damage Classification & Large Language Models (LLM):

- Implemented NLP models to classify damage reports in 10 languages, which resulted in 86% accuracy and automated a previously manual process. Leveraged NLP techniques including tokenization, stemming, and machine translation.
- Fine-tuned GPT-2 on repair protocols to provide instant support to mechanics, which improved response time by 90%.

Management & Leadership:

- Managed a 150k € annual budget for cloud computing, model training, and team resources.
- Supervised 6 Master's and 1 Ph.D. students.
- Responsible for data compliance and data exchange contract between BMW and MAGNA/ZF.

Research Scientist in Optimization, Modelling and Numerical Methods - BMW Group

10/2018 - 12/2021

Automatic Powertrain Construction Design in Constrained Space:

Munich, Germany

- Developed a mathematical model correlating component dimensions with their characteristics. This enabled the analysis of a broader solution domain, and resulted in volume optimization and validation with numerical analysis (e.g., 20% for EMI-Filter).
- Developed a bi-objective real-coded genetic algorithm for the automatic component positioning within constrained design spaces, expanding design solutions exploration. This innovation led to a 13.6% volume reduction in the BMW i3 powertrain.

Student Job - Advanced Modeling and Simulation - Siemens AG

04/2017 - 09/2017

Fluid-dynamic analysis:

Munich, Germany

- Validated three Siemens anti-smoke systems using Ansys and Star-CCM+ ensuring that the device meets the customer's requirements.

UNIVERSITY RESEARCH POSITION

Institute of Computer Graphics - Johannes Kepler University <i>Focus-based Image Segmentation using Deep Learning:</i> <ul style="list-style-type: none">Developed convolutional architectures to segment in-focus and out-of-focus regions in stacked image datasets based on learned noise statistics.	03/2025 - Present Linz, Austria
Chair of Ophthalmology and Optometry - Medical University of Vienna <i>Deep Learning and Implicit Neural Network (INN):</i> <ul style="list-style-type: none">Implemented Deep Learning Architecture for computer-aided diagnosis and preventive treatment of retina vessels. This enabled the identification of veins and capillaries from low-resolution retina images.	05/2024 - 02/2025 Vienna, Austria
Chair of Computational Modelling and Simulation - Technical University Munich <i>Finite Element Method Software Development:</i> <ul style="list-style-type: none">Implemented Plasticity Deformation and Thermal Gradient Matrix routine for FEM Simulation.Implemented H-refinement and P-refinement routine and performed test convergence.	08/2016 - 10/2017 Munich, Germany

EDUCATION

Ph.D. Candidate in Computer Science (RecSys) <i>Johannes Kepler University</i> <ul style="list-style-type: none">Advisor: Prof. Markus Schedl (Multimedia Mining & Search Group)Focus: Multimodal Recommender Systems, Intent-Awareness.	Starting 01/2026 Linz, Austria
M.Sc. in Artificial Intelligence <i>Johannes Kepler University</i> <ul style="list-style-type: none">Advisor: Prof. Sepp Hochreiter (Inventor of LSTM)Thesis: <i>Navigation without Reward: Direct Preference Optimization (DPO)</i> – Implicit policy learning in continuous spaces.Awards: 2x JKU Merit Scholarship for Academic Excellence (2024, 2025).	10/2023 – Present Linz, Austria
Ph.D. in Optimization and Numerical Methods <i>Ruhr-University Bochum</i> Advisor: Prof. P. Tenberge · Thesis: <i>Automation of Design Synthesis for EV Transmissions</i> Focus: Multi-objective Optimization, Genetic Algorithms, Simulation-driven Design Automation.	07/2018 – 03/2023 Bochum, Germany
M.Sc. in Computational Mechanics (CSE) <i>Technical University Munich</i> Advisor: Prof. E. Rank · Thesis: <i>Matrix-Free Conjugate Gradient Method for Finite Cell Method</i> Focus: High-Performance Computing, Advanced Numerical Methods, C++ Implementation.	10/2015 – 11/2017 Munich, Germany
M.Sc. in Management <i>Technical University Munich</i> Examiner: Prof. H. Wildemann Focus: Tech Strategy & Optimization of Logistic Networks.	11/2020 – 11/2023 Munich, Germany
B.Sc. in Mechanical Engineering <i>Polytechnic University of Turin</i>	10/2012 – 07/2015 Turin, Italy
B.Sc. in Mech. & Ind. Engineering (Double Degree) <i>Tongji University</i>	09/2013 – 06/2014 Shanghai, China

ADDITIONAL EDUCATION

Professional Program in Artificial Intelligence <i>Stanford University</i> <ul style="list-style-type: none">Curriculum: Generative Models, NLP for Deep Understanding, Reinforcement Learning	08/2024 - 11/2025 California, USA
NanoDegree in Data Analytics with AWS <i>Udacity</i>	04/2023 - 08/2023 Remote
Professional Program in Data Analytics <i>Technical University Munich</i>	05/2022 - 07/2022 Munich, Germany

SKILLS

Programming Languages	Python C C++ SQL R MATLAB Prolog Popper Apache Spark
Cloud Platforms	AWS Impact
Machine Learning & AI	
Libraries & Frameworks	scikit-learn Tensorflow TFX Pytorch
Techniques	Supervised and Unsupervised Learning Retrieval Augmented Generation (RAG) Reinforcement Learning Deep Learning Reinforcement Learning with Human Feedback (RLHF) Natural Language Processing (NLP) Large Language Models (LLM) Explainable AI Generative models Direct Preference Optimization (DPO) Hyperparameter Search and Supervised Fine Tuning
Simulation & Analysis Tools	Ansys Star CCM+

LANGUAGES

English: Proficient	German: Proficient	Italian: Native	Chinese: Basic user
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PUBLICATIONS AS FIRST AUTHOR

- **G. Filomeno**, M. A. Ahmad, M. Wolkerstorfer, B. Krüger, P. Tenberge, D. Dennin, "Multi-objective electric powertrain design optimization under package constraints," *Electromechanical Drive Systems 2021*, Munich, Germany, 2021.
- **G. Filomeno**, B. Krüger, P. Tenberge, D. Dennin, "Automatic EMI filter design for three-phase PWM inverter used in automotive transmission," *e&i Elektrotechnik und Informationstechnik*, vol. 138, no. 2, pp. 110-116, 2021, DOI: 10.1007/s00502-021-00870-9.
- **G. Filomeno**, B. Krüger, P. Tenberge, D. Dennin, "Rapid Electric Motor Sizing Estimation for Automotive Application with Statistical Approach Using Catalog Values," *International Journal of Mechanical Engineering and Robotics Research*, vol. 9, no. 11, pp. 1457-1462, 2020, DOI: 10.18178/ijmerr.9.11.1457-1462.
- **G. Filomeno**, B. Krüger, P. Tenberge, D. Dennin, "Automatization of Pin Fin Heat Sink Design with Geometric and Fluid Constraints," *International Journal of Mechanical Engineering and Robotics Research*, vol. 9, no. 5, pp. 652-657, 2020, DOI: 10.18178/ijmerr.9.5.652-657.
- **G. Filomeno**, S. Feraco, "Economic, technical and environmental aspects of recycling lithium batteries: a literature review," *Global Journal of Research in Engineering*, vol. XX, pp. 1-8, 2020.

ACADEMIC COMPETITIONS

DCASE 2025 Challenge - Task: Language-based Audio Retrieval	04/2025 - 06/2025
<i>Text-to-Audio Retrieval with Natural Language Queries</i>	<i>International Competition</i>
<ul style="list-style-type: none">• Designed a dual-encoder system (PaSST + RoBERTa-large) with attention-based pooling and masked mean caption embeddings, outperforming the DCASE 2025 baseline built on the 2024 winning system.• Applied partial fine-tuning (audio layers 8-11) and spectrogram augmentation, achieving architectural improvements <i>without increasing model parameters</i>.• Achieved mAP@10 = 36.005 and mAP@16 = 36.661 on ClothoV2, surpassing top-1 and top-10 recall of the official baseline without using ensembles or synthetic captions.	