

Giovanni Filomeno, Ph.D.

[✉️](mailto:giovanni.filomeno.30@gmail.com) [+49 15255435071](tel:+4915255435071) | [github](#) | [linkedin](#) | [scholar](#)

ABOUT ME

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

Munich, Germany

Predictive Maintenance:

- 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

Munich, Germany

AWS ETL Pipeline for Customer Data to Enhance Design Quality:

- 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

Munich, Germany

Automatic Powertrain Construction Design in Constrained Space:

- 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

Munich, Germany

Fluid-dynamic analysis:

- 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	03/2025 - Present
<i>Focus-based Image Segmentation using Deep Learning:</i>	Linz, Austria
• Developed convolutional architectures to segment in-focus and out-of-focus regions in stacked image datasets based on learned noise statistics.	
Chair of Ophthalmology and Optometry - Medical University of Vienna	05/2024 - 02/2025
<i>Deep Learning and Implicit Neural Network (INN):</i>	Vienna, Austria
• 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.	
Chair of Computational Modelling and Simulation - Technical University Munich	08/2016 - 10/2017
<i>Finite Element Method Software Development:</i>	Munich, Germany
• Implemented Plasticity Deformation and Thermal Gradient Matrix routine for FEM Simulation.	
• Implemented H-refinement and P-refinement routine and performed test convergence.	

EDUCATION

Ph.D. Candidate in Computer Science (RecSys)	Starting 01/2026
<i>Johannes Kepler University</i>	Linz, Austria
• Advisor: Prof. Markus Schedl (Multimedia Mining & Search Group)	
• Focus: Multimodal Recommender Systems, Intent-Awareness.	
M.Sc. in Artificial Intelligence	10/2023 – Present
<i>Johannes Kepler University</i>	Linz, Austria
• 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).	
Ph.D. in Optimization and Numerical Methods	07/2018 – 03/2023
<i>Ruhr-University Bochum</i>	Bochum, Germany
Advisor: Prof. P. Tenberge · Thesis: <i>Automation of Design Synthesis for EV Transmissions</i>	
Focus: Multi-objective Optimization, Genetic Algorithms, Simulation-driven Design Automation.	
M.Sc. in Computational Mechanics (CSE)	10/2015 – 11/2017
<i>Technical University Munich</i>	Munich, Germany
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.	
M.Sc. in Management	11/2020 – 11/2023
<i>Technical University Munich</i>	Munich, Germany
Examiner: Prof. H. Wildemann	
Focus: Tech Strategy & Optimization of Logistic Networks.	
B.Sc. in Mechanical Engineering	10/2012 – 07/2015
<i>Polytechnic University of Turin</i>	Turin, Italy
B.Sc. in Mech. & Ind. Engineering (Double Degree)	09/2013 – 06/2014
<i>Tongji University</i>	Shanghai, China

ADDITIONAL EDUCATION

Professional Program in Artificial Intelligence	08/2024 - 11/2025
<i>Stanford University</i>	California, USA
• Curriculum: Generative Models, NLP for Deep Understanding, Reinforcement Learning	
NanoDegree in Data Analytics with AWS	04/2023 - 08/2023
<i>Udacity</i>	Remote
Professional Program in Data Analytics	05/2022 - 07/2022
<i>Technical University Munich</i>	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

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

Text-to-Audio Retrieval with Natural Language Queries

International Competition

- 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 *without increasing model parameters*.
- 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.