



Dr. Steffen Illium
Machine Learning Expert
Data Scientist
Researcher

Data and Contact

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Fields of research

Machine Learning & Data Science,
Data Augmentation & Synthesis,
Anomaly & OOD Detection,
Classification & Segmentation,
RL & Multi-Agent Systems,
Geoinformatics & Gen. Algorithms,
Spatial Data Analysis

Softskills

Structured, Fast comprehension, Strong analytical skills, Organizational skills, Independent & collaborative, Clear communicative, Self-reflective, Curious & Innovative, Capable of resolving conflicts, Capable of implementing feedback

Summary

Skilled Machine Learning Researcher and Data Science Expert with a PhD in Computer Science. Brings 6+ years of experience developing and analyzing algorithms, models and foundational research, evidenced by numerous publications. Proven ability to translate complex technical concepts into practical solutions and communicate effectively with diverse stakeholders. Seeking roles to apply deep expertise in AI/ML, data science, and problem-solving to drive impactful results.

Academic career

- 2018 - 2024 **PhD in Computer Science** Grade [Redacted] | LMU Munich
Conducted doctoral research focused on Data Science and Neural Networks. Developed and evaluated advanced models for sequential data analysis, computer vision and self-learning systems. Contributed significantly to foundational research while applying novel techniques to real-world datasets, advancing knowledge in the field.
- 2015 - 2018 **MSc Geo-Informatics** Grade [Redacted] | Augsburg University
Developed applied expertise in Geo-Informatics, mastering programming across many languages and database systems relevant to the field. Culminated in a Master's thesis pioneering a novel deep neural network approach for the automatic clustering of topological spatial data.
- 2010 - 2015 **BSc Geography** Grade [Redacted] | JGU Mainz
Focused on foundational geographical principles and scientific exploration, progressively specializing in computer-based analysis, geodata, and geoinformation systems. Established a strong base for advanced studies in spatial data handling and analysis.

Professional experience and roles

- 2024 **Senior AI Consultant** [Redacted] | XITASO GmbH
[Redacted]
- 2018 - 2024 **Research Assistant & PhD. Candidate** [Redacted] | LMU Munich
 - Projects "InnoMi" with StMWi Bavaria ([Redacted])
"ErLoWa" (leak detection in water networks) with SWM ([Redacted])
"AI-Fusion" with Fraunhofer IKs ([Redacted])
 - Teaching IOS (2020) & Android (2019-2023) practical seminar
Bachelor's seminar & Master's seminar (2020-2023),
Python Course, individual supervisions (4)
Supervision of Bachelor's (20) & Master's theses (9),
 - Other Head of "DIGITALE WELT" online editorial team [Redacted]
Head of conference organization "OpenMunich" [Redacted]
Assistance in conference organization "DIGICON" [Redacted]
Responsible for personnel in project management and teaching.
- [Redacted] **Working student** [Redacted]
[Redacted]
- [Redacted] **Time spent abroad (6 months)** [Redacted]
[Redacted]
- [Redacted] **Geography research assistant** [Redacted] | JGU Mainz
[Redacted]

Selected Publications

2024	<i>Emergence in Multi-agent Systems: A Safety Perspective</i> <i>Aquarium: A Comprehensive Framework for Exploring Predator-Prey Dynamics through Multi-Agent Reinforcement Learning Algorithms</i>
2023	<i>VoronoiPatches: Evaluating a New Data Augmentation Method</i> <i>Compression of GPS Trajectories using Autoencoders</i>
2022	<i>Empirical Analysis of Limits for Memory Distance in RNNs</i> <i>Towards Anomaly Detection in Reinforcement Learning</i>
2021	<i>Visual Transformers for Primates Classification and Covid Detection</i> <i>Acoustic Anomaly Detection for Machine Sounds based on Image Transfer Learning</i>
2020	<i>A Hybrid Approach for Segmenting and Fitting Solid Primitives to 3D Point Clouds</i> <i>Surgical Mask Detection with Convolutional Neural Networks and Data Augmentations on Spectrograms</i>

Talks

2024	"How data-driven knowledge extraction and AI are alleviating the skills shortage" (<i>german language</i>) Bitkom Bitzip
	"GenAI interface: How know-how is preserved and made available" (<i>german language</i>) Bitkom Group of ML Experts
2018-2023	Paper and Research Presentations International conferences
2019	Panel Discussion - "Data & AI in Open Source" OpenMunich

Associations

2024	Bitkom & VDMA: Company Representation in AI Expert Groups
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Award

2023	International Conference on Agents and Artificial Intelligence (ICAART) - Best Poster Award
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Further information

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Systems

Arch Linux, NixOS, Debian Linux,
Docker (Swarm), Kubernetes, Traefik,
Network- & Server-Administration

Programming

Python, LaTeX, HTML & CSS, Kotlin,
PHP, SQL, MongoDB, CI/CD, YAML,
Templating

Software & Libraries

Numpy, PyTorch, Lightning, Pandas,
Optuna, Bash/Shell, VS Code & IntelliJ,
Traefik, CephFS, git, WireGuard, ZFS,
MS Office

LLM & Agent Experience

LangGraph, FastAPI, Chroma, Local
Models in Ollama, Gemini (Google),
GPT (openAI), claude (anthropic),
Agentic Workflows and Architecture,
Conversation handling, RAG, GraphRAG,
Context Injection

Languages

German (Native),
English (Fluent / C1)

Private Projects & Interests
