# Dr. Joseph Nagel

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PyTorch TensorFlow JAX Lightning transformers

scikit-learn pandas OpenCV MLflow pytest

Git Docker SQL Spark AWS GCP

## Experience

since 2025 **Associate Director (Staff ML Engineer)**, Moody's Analytics, *Munich*
*Computer Vision on Aerial Imagery for Property Risk*
- *Finetuned ViT-based foundation models with LoRA and other PEFT techniques*
- *Ensured the quality of model predictions at new geographic locations in the context of international expansion*

2024–2025 **Cofounder / Head of AI**, Validaitor, *Munich*
*Startup for Safe and Trustworthy AI*
- *Helped raising €700k of pre-seed funding*
- *Implemented a platform for adversarial robustness assessment in the context of tabular data*
- *Finetuned LLMs for detecting and classifying toxicity of AI-generated texts*

2021–2023 **ML Research Engineer**, Epic Games, *Munich*
*R&D in Generative AI for 3D Animation*
- *Productized the C++ optimization problem solver of the Unreal Engine MetaHuman Animator®*
- *Improved motion capture through VAE-based prior models (90% reduction of end user complaints)*
- *Developed RNN and CNN algorithms for time series forecasting of future animation frames*
- *Enabled the style transfer between different emotions in an animation with GANs and DDPMs*

2018–2021 **Senior Data Scientist**, Airbus, *Munich*
*R&D for Robust Deep Learning and Computer Vision*
- *Initiated and led a research project on safety-critical AI*
- *Realized a confidence estimation POC for predicting the landing distance based on Bayesian neural networks*
- *Conducted a project on the robustness of visual collision avoidance during autonomous aircraft taxi*
- *Developed a 3D detector for material defects in CT scans of additive manufacturing (30% cost reduction)*

## Education

2012–2017 **PhD in Computational Science & Engineering**, ETH Zurich, *Switzerland*
*Research in Machine Learning for Physical Simulations*
**Thesis:** *"Bayesian Techniques for Inverse Uncertainty Quantification"* (*doi:10.3929/ethz-a-010835772*)
**Distinctions:** *ETH Medal, Prize by the Swiss Community for Computational Methods in Applied Sciences*
**Topics:** *Uncertainty Quantification • Statistical Inference • MCMC • Inverse Problems*
**Projects:** *Forecasting of urban river floods for risk assessment and decision-making • Dam breach uncertainty analysis from simulations and historical failure data • Prediction of the structural performance of masonry walls with brick-level data • Damage identification for a civil NASA aircraft from in-flight measurements*

2005–2011 **Diploma in Physics**, University of Bonn, *Germany*
*Specialization in Theoretical Physics and Scientific Computing*
**Thesis:** *"Lattice Quantum Chromodynamics on GPUs"*, **Grade:** *1.4*