Nicolas Forstner

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Education

2018-2022 — University of York (Russel Group)
MEng (Hons) Computer Science with Artificial Intelligence
- Recipient of the IET Prize for the most outstanding student of my year.
- First class honors with firsts in all four years of the degree. Transcript available on nforstner.com/transcript.pdf.
- Third year thesis on object tracking using conventional video and optical flow.

2017 — School
German (Bavarian) Abitur *with a grade average of 1.6 (1 is best, 6 is worst)*

Work Experience

June & July 2022 — University of York
Research support assistant - Telemedicine with AI for COVID-19 patients
- Analysed and consolidated the team's research towards using AI to diagnose COVID-19 infections to prepare them for publication in journals such as PLOS.
- Developed integrations for AI models to facilitate their internal usage.

July & August 2020 — Atos
Intern - Consulting for data science and artificial intelligence
- Contributed to a project for the German military (BWI) involving the detection of humans through walls using radio signals.
- Trained a cross-modal teacher-student model and developed a complex data pipeline to process sensor data.
- Presented the team's work to customers and managed further communication as part of our SCRUM cycle.

September 2019 — Atos
Intern - Consulting for data science and artificial intelligence
- Developed software that uses machine learning to improve the efficiency of a production line for electrical parts in a Siemens factory.
- By making heavy use of data preprocessing and hyper-parameter optimization, my approach was able to beat all alternatives and was chosen to be deployed into production.

August & September 2018 — Padberg & Partners
Internship - Web development and task automation
- Contributed to the development of open-source marketing platform *Mautics*.
- Automated migrations from proprietary software to open-source alternatives.

Skills

General:	Strong passion for deep learning with excellent engineering abilities. Proven communication skills and exceptional ability to explain and teach.
Machine Learning:	Transformers, Diffusion, Generative AI, implementation and debugging of custom model architectures and training loops, training on HPC clusters. PyTorch, Jax, DeepMind-Haiku, Hugging Face ecosystem
Languages:	Python, Rust, JavaScript, LaTeX, some C and CUDA
Other:	Linux, Git, GitHub, Docker, Slurm, GCP, AWS, NeoVim
English:	Excellent
German:	Native

Selected Projects

MiniGPT: A minimal re-implementation of OpenAI's GPT in Jax with DeepMind-Haiku. Features include: Modern architecture improvements such as pre-norm and Rotary positional embeddings, multi-GPU training support, automatic mixed-precision, rich telemetry and full configurability with yaml files. GitHub

Kigo A diffusion model to generate images. Features include (in addition to those above): DDIM sampling with impressive results after only 16 sampling steps, remote logging to WeightsAndBiases, utilities for training on Slurm clusters. GitHub

Timber A minimal programming language with a stack-based virtual machine. Includes functions, loops, conditionals, pointers and basic I/O. Check out this *Hello World* program in Timber! GitHub