

DANIEL KUSUMA

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Education

Rheinisch-Westfälische Technische Hochschule Aachen

Apr. 2023 – Oct. 2025 (expected)

Master of Science in Electrical Engineering, major in Computer Engineering

Aachen, Germany

Technische Universität Braunschweig

Oct. 2017 – March 2023

Bachelor of Science in Electrical Engineering, major in Computer Engineering

Braunschweig, Germany

Experience

Convista AG

since Oct. 2024

Working Student

Köln, Germany

- Working on document understanding and information extraction/retrieval.

Learning on Graphs Group

July 2023 - Sep. 2024

Student Assistant (i6 Chair of Machine Learning and Reasoning)

Aachen, Germany

- Contributing in a work on the algorithmic reasoning of a Graph Transformer variant. The work is currently archived in arXiv and is accepted for NeurIPs 2024.
- Running and managing experiments on various benchmarks.
- Taking care of group's website.

Signal Processing and Machine Learning Lab

May 2022 – June 2023

Student Assistant (Institute for Communications Technology)

Braunschweig, Germany

- Implementing a performance prediction framework for semantic segmentation and object detection with varying state-of-the-art backbones such as ResNet-based to Transformer-based architecture in a modular way to accommodate further extensive studies.
- Reproducing paper benchmark results with own and external codebases.
- Running extensive experiments including efficient trainings and evaluations on the lab's GPU cluster.
- Contributing and co-authorship to lab's scientific publications.

Data Science in Biomedicine

May 2022 – June 2023

Student Assistant (Peter L. Reichertz Institute for Medicine Informatics)

Braunschweig, Germany

- Building with the team for the project KI4ALL a centralised directory of educational materials around machine learning and its applications. We were working to make topics around ML accessible for everyone.

IAV GmbH

Oct 2019 – May 2022

Working Student

Braunschweig, Germany

- Maintenance, servicing and extension as well as programming and verification of scripts for the automatic evaluation of measurement data using UniPlot and UniScript.
- Analysis of measurement data using internal tools.
- Care, maintenance, expansion, programming and verification of scripts for automatic evaluation of measurement data using UniPlot and UniScript.

Projects

Graph Transformer for Algorithmic Reasoning | *PyTorch, Jax*

Dec 2023

- Implemented a Graph Transformer variant (Edge Transformer) in Jax.
- Experimented with Edge Transformer for the CLRS algorithmic reasoning benchmark. GitHub repository: <https://github.com/ksmdnl/clrs>
- Contributed as coauthor.

Improvements on the Performance Prediction | *PyTorch*

Nov 2022 – Mar 2023

- Improved the Performance Prediction framework using modular training techniques.
- Contributed as a coauthor.
- Repository: <https://github.com/ifnspaml/PerfPredRecV2>

Bachelor Thesis | *PyTorch*

Feb 2022 – May 2022

- Extended the pre-built Performance Prediction framework to an object detection model. The Performance Prediction framework attempts to make and study the safeness of semantic segmentation models in the real-world application.
- Studied the loss functions for the Performance Prediction framework and improved the regression performance by investigating relevant metrics such as structural similarity.

Publications

Andreas Bär, Daniel Kusuma, and Tim Fingscheidt. Improvements to image reconstruction-based performance prediction for semantic segmentation in highly automated driving. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, pages 219–229, June 2023

Luis Müller, Daniel Kusuma, Blai Bonet, and Christopher Morris. Towards principled graph transformers, 2024

Technical Skills

Languages: Python, Java, bash
Frameworks: PyTorch, Tensorflow, Jax, Linux, GitHub, LaTeX

Volunteer

Association of Indonesian Students in Braunschweig **Oct 2017 – Dec 2019**
Vice President *Technische Universität Braunschweig*

- Maintained communication between the association and the student initiatives within campus.
- Supported the association to hold a successful cultural night to introduce Indonesian culture to broader public.

Representation of Foreign Students (Ausländischer Vertretung) **Since April 2024**
RWTH Aachen

- Helping in providing information and consultation for international students as well as in creating relevant workshops.

Interests

Judo Learning and practicing martial arts plays a big role in establishing a balance between mind and body.
Reading about biology Learning about biology at times makes me personally appreciate our place in the world.
Playing or making music During my adult life I noticed that making music or learning new songs helps me being creative.

Languages

Professional profeciency German, English
Native Indonesian, Javanese