

# DANIEL KUSUMA

Eifelstraße 44, 50268 Aachen, Germany

☎ +491781961480 ✉ [daniel.gabrielyudha@gmail.com](mailto:daniel.gabrielyudha@gmail.com) 🔗 [linkedin.com/in/daniel-kusuma](https://www.linkedin.com/in/daniel-kusuma) 📄 [github.com/ksmdnl](https://github.com/ksmdnl)

## Education

---

### Rheinisch-Westfälische Technische Hochschule Aachen

*Master of Science in Electrical Engineering, major in Computer Engineering*

Apr. 2023 – Sep. 2025 (expected)

Aachen, Germany

### Technische Universität Braunschweig

*Bachelor of Science in Electrical Engineering, major in Computer Engineering*

Oct. 2017 – March 2023

Braunschweig, Germany

## Experience

---

### Learning on Graphs Group

*Student Research Assistant (i6 Chair of Machine Learning and Reasoning)*

since July 2023

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 ICLR BGPT Workshop 2024.
- Running and managing experiments on various benchmarks.
- Developing open source API for experiments in graph learning.
- Taking care of group's website.

### Signal Processing and Machine Learning Lab

*Student Research Assistant (Institute for Communications Technology)*

May 2022 – June 2023

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 to lab's scientific publications.
- Co-authorship to lab's scientific publications.

### Data Science in Biomedicine

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

May 2022 – June 2023

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

*Working Student*

Oct 2019 – May 2022

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.

### Teacher-Student Network for Semantic Segmentation | *PyTorch*

Mar 2023 – June 2023

- Studied the learning algorithms in a Teacher-Student setup such as knowledge distillation or applying inverse feature matching loss.

### 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>

- Reproducing result of Single Shot Detector using ResNet-18.
- Studied the merging algorithm for the outputs of multiple detection models.

**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.

**Preprints**


---

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

**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

**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.

**Interests**


---

**Judo and Brazilian jiu-jitsu** 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 proficiency** German, English

**Native** Indonesian, Javanese