Albert Kjøller Jacobsen

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RESEARCH INTERESTS

Deep learning theory, differential geometry in machine learning, probabilistic machine learning, signal processing

EDUCATION

Technical University of Denmark (DTU), Kongens Lyngby, Denmark — September 2022 — February 2025
Master of Science in Engineering: Human-Centered Artificial Intelligence — Cumulative GPA: 11.05/12.00
Thesis title: On Riemannian Sharpness-Aware Minimization for General Losses

Technical University of Denmark (DTU), Kongens Lyngby, Denmark — September 2019 — June 2022
Bachelor of Science in Engineering: Artificial Intelligence and Data Science — Cumulative GPA: 10.07/12.00
Thesis title: Visual Question Answering with Knowledge-based Semantics

École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland — September 2021 — February 2022
Exchange semester at the School of Computer and Communication Sciences (IC)

ACADEMIC EXPERIENCE

Section for Cognitive Systems, DTU Compute — Kongens Lyngby, Denmark
Research Assistant — March 2025 — · · ·

- Employed on the *"GADL: Geometric Analysis of Deep Learning"* project.

Student Research Assistant — March 2024 — June 2024

- Employed on the *"Cognitive Spaces - Next Generation Explainability"* project.
- Investigated redundancy in transformer models, in charge of computational experiments.
- Shared first author of the resulting paper that summarized the work on redundancy.

Teaching Assistant — September 2020 — December 2024

- 02450 Introduction to Machine Learning and Data Mining (fall 2022 and fall 2024)
- 02461 Introduction to Intelligent Systems (fall 2020)
- 02462 Signals and Data (spring 2021)
- 02471 Machine Learning for Signal Processing (fall 2023)
- 02477 Bayesian Machine Learning (spring 2024)

Danish Energy Agency, Center for System Analysis and Innovation — Copenhagen, Denmark
Student Assistant — April 2022 — March 2024

- Development of weather-dependent energy models, e.g. forecasting framework for electricity and gas consumption
- Simulating trading of renewables with a reinforcement learning agent relying on evolutionary strategies.
- Continuous development of a techno-economic optimization model used in Denmark's Climate Status and Outlook.
- Data infrastructure including CI/CD, package design and database management

PUBLICATIONS

Conference papers

- T Dorszewski*, **AK Jacobsen***, L Tětková, LK Hansen, *How Redundant is the Transformer Stack in Speech Representation Models?*, International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2025.

  A workshop version of the paper was presented at the 4th Workshop on Efficient Natural Language and Speech Processing (ENSLP) at NeurIPS 2024.

Pre-prints

- **AK Jacobsen**, G Arvanitidis, *Monge SAM: Robust Reparameterization-Invariant Sharpness-Aware Minimization for General Losses*

GRANTS & AWARDS

- **IEEE Signal Processing Society (SPS) Travel Grant for ICASSP 2025**
- **Runner up for the best short paper award at NeurIPS ENSLP workshop 2024**

> *My paper "*How Redundant is the Transformer Stack in Speech Representation Models*" was one of the top three candidates for the best short paper at the ENLSP workshop at NeurIPS 2024.*

OTHER PROJECTS

Cooperative Embodied Intelligence Lausanne, Switzerland
Visual Intelligence course (ID: CS-503) at EPFL. September 2021 — February 2022

- Creating a reinforcement system acting on visual stimuli to control multiple agents in a game-based environment. The project title was *"Distributed Vision in Reinforcement Learning for Object Navigation"*.

Active Bayesian Deep Learning Kongens Lyngby, Denmark
Special course at DTU - student project September 2023 — February 2024

- Examining the EPIG acquisition function by verifying derivations and experiments from the paper *"Prediction-Oriented Bayesian Active Learning"*. Supervised by Associate Professor Michael Riis Andersen.

REFERENCES

Prof. Lars Kai Hansen
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Scholar Profiles: Google Scholar

Associate Professor Georgios Arvanitidis
Associate Professor, Department of Applied Mathematics and Computer Science, Technical University of Denmark
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