

LUKAS HEDEGAARD MORSING

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SKILLS

- Python, C++, C, JavaScript, Java, Matlab, R, Julia, Shell, Rust, SQL, UML, Linux
- Deep Learning, Computer Vision, Natural Language Processing, Embedded Systems
- Agile Project Management, TDD, OOP, CI/CD, DevOps, GitFlow
- English, Danish, Polish, German – prof. level or above

EXPERIENCE

PH.D. FELLOW AARHUS UNIVERSITY

Aarhus, DK Feb 2020 – Jun 2023

- First-authored papers at top ML conferences and journals, including ICLR, ECCV, PR, & TIP.
- Accelerated state-of-the-art Human Action Recognition models by more than 10x.
- Closely collaborated with European partners on the EU Horizon 2020 OpenDR project.
- Procured, configured, and maintained GPU server infrastructure for research group (Linux).
- Designed course material and taught Statistical Learning and Machine Learning.
- Created multiple open-source libraries (PyTorch, TensorFlow, >400k downloads).

VISITING RESEARCHER CACTUS COMMUNICATIONS

Aarhus, DK Mar 2022 – Aug 2022

- Worked with a globally distributed team of scientists and engineers (NLP, AWS).
- First-authored paper on parameter-efficient adaptation of large neural networks.

SOFTWARE ENGINEERING CONSULTANT BIIR

Aarhus, DK Feb 2018 – Aug 2020

- Worked as project manager, scrum master, and lead developer of cloud service for automated analytics solution (Azure, Jira, JavaScript, MSSQL).
- Identified business needs and specified requirements in collaboration with stakeholders.
- Developed of in-house job market analytics tool (web scraping, Elasticsearch).

SOFTWARE ENGINEER TC ELECTRONIC

Aarhus, DK Feb 2016 – Aug 2018

- Developed mobile applications (React-native, Redux).
- Co-developed novel concept for intelligent speaker system within cross-functional team.
- Developed firmware for real-time embedded systems (C++).

SOFTWARE ENGINEERING INTERN TC ELECTRONIC

Aarhus, DK Aug 2015 – Jan 2016

- Automated hardware and software tests of digital amplifiers.

EDUCATION

PH.D. AARHUS UNIVERSITY

Aarhus, DK Feb 2020 – Jun 2023

- Researched efficient deep learning for Computer Vision and NLP.

M.SC. COMPUTER ENGINEERING AARHUS UNIVERSITY

Aarhus, DK Feb 2018 – Feb 2020

- Weighted GPA of 11.4/12.0 (95%), ML, CV, signal processing, real-time embedded systems.

CERTIFIED SCRUM MASTER SCRUM ALLIANCE

Online

Oct 2019

- Certification ID: 1043951

B.E. ELECTRICAL ENGINEERING AARHUS UNIVERSITY

Aarhus, DK Sep 2013 – Feb 2017

- Weighted GPA of 11.2/12.0 (93%), adv. programming, systems engineering, control theory.

PUBLICATIONS

L. Hedegaard, N. Heidari, and A. Iosifidis, "Continual Spatio-Temporal Graph Convolutional Networks," in *Pattern Recognition*, 2023.

L. Hedegaard, A. Bakhtiarnia, and A. Iosifidis, "Continual Transformers: Redundancy-Free Attention for Online Inference," in *International Conference on Learning Representations (ICLR)*, 2023.

L. Hedegaard and A. Iosifidis, "Continual 3D Convolutional Neural Networks for Real-time Processing of Videos," in *European Conference on Computer Vision (ECCV)*, 2022.

L. Hedegaard and A. Iosifidis, "Continual Inference: A Library for Efficient Online Inference with Deep Neural Networks in PyTorch," in *European Conference on Computer Vision Workshop (ECCVW)*, 2022.

L. Hedegaard, O. Sheikh-Omar, and A. Iosifidis, "Supervised Domain Adaptation: A Graph Embedding Perspective and a Rectified Experimental Protocol," in *IEEE Transactions on Image Processing (TIP)*, 2021.

L. Hedegaard, O. Sheikh-Omar, and A. Iosifidis, "Supervised Domain Adaptation using Graph Embedding," in *International Conference of Pattern Recognition (ICPR)*, 2021.

L. Hedegaard, N. Heidari, and A. Iosifidis, "Human Activity Recognition", in *Deep Learning for Robot Perception and Cognition*, Elsevier, 2022.

N. Heidari, **L. Hedegaard**, and A. Iosifidis, "Graph Convolutional Networks", in *Deep Learning for Robot Perception and Cognition*, Elsevier, 2022.

L. Hedegaard, A. Alok, J. Jose, and A. Iosifidis, "Structured Pruning Adapters," *preprint*, arXiv:2211.10155, 2022.

OPEN-SOURCE PROJECTS

- | | |
|-----------------------|---|
| • Continual-Inference | <i>Toolkit for efficient stream processing in PyTorch.</i> |
| • OpenDR | <i>Open toolkit for robotics harnessing Deep Learning.</i> |
| • Ride | <i>Minimum-code modular framework for Deep Learning.</i> |
| • DatasetOps | <i>Dataset operations, compatible with major ML libraries.</i> |
| • PyTorch-Benchmark | <i>Measure FLOPs, latency, throughput, gpu memory and energy.</i> |
| • Supers | <i>Call a function in all superclasses effortlessly.</i> |

REFERENCES

Dr. Alexandros Iosifidis, Full Professor at Aarhus University
+45 9350 8875 ai@ece.au.dk

Henning Johnsen, MBA, Design Center Manager Europe at Ballard Power Systems
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Reference Letter for Lukas Hedegaard Morsing

To Whom it may concern,

With this letter, I would like to support the application of Mr. Lukas Hedegaard Morsing for a post at your organization. His qualifications relevant to this post are detailed in his curriculum vitae, so I will not repeat them here.

I have known Lukas since 2018 when, during his studies, he attended courses on data analytics, and computer vision and machine learning, taught by me at Aarhus University. The following year he, together with a fellow student, chose to take an R&D project in topics related to natural language processing in collaboration with a company. I served as examiner for that project, and I was happy to see that its quality was among the best I have seen. Lukas (and the same fellow student) later did their M.Sc. thesis under my supervision on the topic of Supervised Domain Adaptation. The thesis led to new scientific findings which were presented at the International Conference on Pattern Recognition (the flagship conference of the International Association for Pattern Recognition) and published in the top international journal for visual data analysis (IEEE Transactions on Image Processing).

Lukas is currently pursuing Ph.D. studies in my group, under my supervision. He is an excellent young scientist and engineer pursuing research in machine learning finding application in computer vision (and, lately, natural language processing) problems. He is self-driven and independent. His work is characterized by creativity, precision, and critical thinking for the studied problems and existing approaches. He has high-quality software development skills. His scientific contributions are at the top international standards, and are expected to be published at the very top venues/journals of the field.

Lukas has contributed to the group in various ways, from contributing to an EU project and interacting with partner institutions around Europe, to helping in designing and setting up our computing equipment. Moreover, he is a pleasant person to interact and collaborate with, and he has been actively participating and organizing social activities of the group.

To conclude, I have no hesitation to give my strongest recommendation for Lukas. I believe that he will be an asset for your organization. Please do not hesitate to contact me should more information is needed from my side.

Sincerely,



Alexandros Iosifidis
Professor

Head of Machine Learning & Computational Intelligence group
Lead of Machine Intelligence at AU Centre for Digitalisation, Big Data & Data Analytics
Department of Electrical and Computer Engineering
Aarhus University, Denmark

Department of Electrical &
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Alexandros Iosifidis
Professor

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February 8th, 2023

To whom it may concern:

My collaboration with Lukas Hedegaard Morsing as an employee, student worker and student, spans across several years.

He started out with his Trainee period during his bachelor's degree, structuring and designing the first version of a new test system. With his analytical approach and great understanding for technology, he brought it to the first MVP and made it work.

In his thesis for the bachelor's degree, he conducted the research with a fellow student, to bring and proof the idea of an acoustical locations and positioning method. A concept that would be implemented directly into a commercial product – due to its nature of solving a problem and a value creation to the product line that had not been seen before.

Furthermore, Lukas has a keen understanding of Agile way of working, with focus on value creation and how to verify this – before jumping into details of the integration.

Meaning Lukas can take the role of lead engineer or Architect of any product or system. Through his structured approach and analytical mindset.

He will keep track of the progress and include his fellow colleagues, as he is a teamplayer and well regarded by the people around him.

Lukas has a very professional attitude and high moral towards his tasks. Regardless of if it is a small student assignment or a project with customers directly involved on a larger scale.

His ability to learn new coding languages or studying complex phenomena's is to me a trademark of Lukas. Failing is a natural way of development, and due to Lukas' moral and work ethics – he has always found a way through the problems. Kept continuing and focusing on the goal.

Strengths to highlight: Intelligent, Structured, Analytical, Polite and high morals, Positive attitude.

It has been my pleasure to follow Lukas' development from student, to engineer and now watching him conduct higher degrees within a complex field of technology.

Lukas is one of the few persons how comes into the "special-kind" and high performing class of people.

I would employ Lukas again at any given chance and can only give him my very best recommendations for any future employer or sponsor.

Periods confirmed.:

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|--------------|----|-----------|--|
| • 2015- Aug. | to | 2016-Jan. | (TC Elec.) Engineering Trainee |
| • 2016-Feb. | to | 2017-Jan. | (TC Elec.) Student worker (SW-Engineering) |
| • 2017-Feb. | to | 2018-Feb. | (TC Elec.) Software Engineer |
| • 2018-Aug. | to | 2020-Mar. | (Biir) Software Engineer (Cloud/Analytics) |

Henning Johnsen

