

AYUSH SOMANI

Portfolio: www.ayushsomani.com

PhD Stipendiat, Book Author

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PROFESJONELT SAMMENDRAG

PhD-stipendiat i informatikk med spesialisering i forklarbar kunstig intelligens (AI), biomedisinsk bildebehandling og datavisjon. Dokumentert erfaring med tverrfaglige forskningsprosjekter, utvikling av AI-løsninger og publisering av innflytelsesrike artikler. Dyktig i Python og PyTorch, og søker å bruke ekspertisen i en høyinnflytelsesrik rolle i Norges teknologilandskap.

FERDIGHETSSAMMENDRAG

Programming Languages: Python, C++, Solidity, HTML, CSS, LaTeX
Work Knowledge: MATLAB, Visual Code, Docker, GIT, GCP, Azure, SQL, Kubernetes, CUDA
Frameworks: Tensorflow, PyTorch, Keras, CMake, Boost C++ Libraries, Flask
Soft Skills: Leadership, Teamwork, Project Management, Creative Outreach, Adaptability

ARBEIDSERFARING

- PhD Stipendiat, UiT The Arctic University of Norway** Juli 2021 – nå
– Specialized in Explainable AI, improving model transparency and diagnostic accuracy in medical imaging by 20%.
– Published in top-tier conferences (e.g., CVPR, ICIP).
- Erasmus+ Staff Mobility, University of Illinois Urbana-Champaign, USA** September 2023
– Secured grant for a visiting researcher position at the Center for Label-free Imaging and Multiscale Biophotonics.
– Gained expertise in advanced AI and computational biology methodologies and interdisciplinary practices.
- Research Intern, N-CRIPT Lab, National University of Singapore** Januar 2023 – Mai 2023
– Investigated interpretable AI, focusing on fuzzy deep learning and neuro-symbolic AI.
– Published a hypergraph-based image filling approach in CVPR 2023 workshop, improving 4x image resolution.
- INTPART Research Fellow, UiT The Arctic University of Norway** Januar 2021 – Juni 2021
– Secured funding from DIKU and the Research Council of Norway for optical nanoscopy research (Project no. 309802).
– Published a paper on deep learning and optical imaging, fostering interdisciplinary collaboration with IIT Delhi.
- Remote Pilot Intern, Indian Institute of Technology (ISM) Dhanbad, India** April 2020 – September 2020
– Developed a deep learning-based object detection system, improving vessel detection accuracy by 30%.
– Designed color constancy algorithms, contributing to maritime safety initiatives and computational photography.
- Data Scientist Intern, Travel Buddy, Gurugram, India** Mars 2020 – Mai 2020
– Streamlined content moderation with BERT and F-RCNN, achieving 83% accuracy and 55% faster review time.
– Developed RESTful APIs for automated moderation, leading to a 78% decrease in toxic content reports.
- Data Analyst (Summer Internship), Qik Stay Pvt. Ltd, New Delhi, India** Juni 2019 – Juli 2019
– Developed a pilot program to boost ancillary revenues through RFM analysis for profitable customer identification.
– Built a linear regression model to predict hotel room prices, achieving an R-squared value of 0.86.

UTDANNING

- PhD in Computer Science** Juli 2021 – nå
UiT The Arctic University of Norway, NORWAY 180 studiepoeng
- Integrated Master of Technology in Mathematics and Computing** Juli 2016 – Mai 2021
Indian Institute of Technology (Indian School of Mines) Dhanbad, INDIA 300 studiepoeng
- Special Curriculum in Digital Staining of Microscopy Images - Master's degree** Høst 2020
UiT The Arctic University of Norway, NORWAY 20 studiepoeng
- Tilleggsstudier:**
- Deep Dive into Blockchain, University of Zürich, SWITZERLAND – 6 ECTS Sommer 2020
 - Bachelor of Fine Arts, Chitrakut Fine Art School, INDIA - First Class Distinction (apprenticeship) 2005 - 2014

SPRÅK

- English:** Fluent (Oral & Written)
Norwegian - Bokmål: Basic Skills (Oral & Written). Committed to improving proficiency through ongoing courses.
Hindi: Native Speaker

PROSJEKTER OG INTELLEKTUELLE BIDRAG

Interpretability in Deep Learning (Book Author)

Mai 2023

Authored a comprehensive 466-page book on Explainable deep learning, integrating theoretical foundations with practical methodologies to address critical challenges in AI transparency. [Link]

Dedicated Website and Online Resources

Mai 2023

Developed www.indeeplearning.org, a platform offering free resources and educating researchers and practitioners on interpretable deep learning. Released an partial IDL course lecture on YouTube [Link]

Incentivized Social Welfare Coin (Blockchain)

Juli 2020

Developed a decentralized TypeScript application on the NEO ONE platform to promote societal contributions via tokenization. Designed smart contracts for bike-sharing, enhancing community engagement and resource sharing.

Flipkart GRiD 2.0: Machine Learning & Software Development Challenge

August 2020

Achieved National Finalist status out of 29,000+ participants by developing an image-processing solution for e-invoicing with 87.19% text recognition accuracy and a multi-threaded pipeline. (Youtube link).

Walmart 36-Hours Coding Hackathon, HackFest'19, IIT ISM Dhanbad, India

Mars 2019

Ranked Top 10 out of 138 teams by designing a Smart Shopping Cart prototype with AI-based object detection and automated billing. Integrated microprocessor, Zigbee, infrared, and weight sensors to enable faster check-out.

PUBLIKASJONER

Book: Somani A, Horsch A, Prasad DK. "Interpretability in Deep Learning." Vol. 2. Springer, 2023. (Hardcover ISBN : 978-3-031-20638-2) DOI: <https://doi.org/10.1007/978-3-031-20639-9>.

ICIP 2024: Somani A, et al. "Blend & Predict: Domain-Adaptable Few-Shot Learning for Microscopy Imaging." 2024 IEEE International Conference on Image Processing (ICIP). IEEE, 2024.

CVPR 2024: Sharma A, et al. "HDL-SAM: A Hybrid Deep Learning Framework for High-Resolution Imaging in Scanning Acoustic Microscopy. In Proceedings Synthetic Data for Computer Vision Workshop, CVPR 2024.

CVPR 2023: Somani A, et al. "Image inpainting with hypergraphs for resolution improvement in scanning acoustic microscopy." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. 2023.

BOE 2022: Somani A, et al. "Virtual labeling of mitochondria in living cells using correlative imaging and physics-guided deep learning." Biomedical Optics Express 13.10 (2022): 5495-5516.

ISBI 2022: Singh D, et al. "Counterfactual explainable gastrointestinal and colonoscopy image segmentation." 2022 IEEE 19th International Symposium on Biomedical Imaging (ISBI) 2022.

PRISER OG UTMERKELSER

Forsker Grand Prix 2024: Selected among 9 PhD candidates for a prestigious training program culminating in a research communication show during the Research Days in Tromsø. [Link]

PROGRESS Travel Grant 2024: Top 12 researchers by IEEE Signal Processing Society at ICIP 2024, Abu Dhabi.

Dare2Compete Awards 2021: Featured in Forbes India for excellence in multiple global competitions.

Samsung Innovation Award 2020: National winner recognized by Samsung Research Centre, Bangalore.

Gold Honour: Finalist in International Mathematics Youth Challenge 2019.

ANSVARSTILLINGER

TPC Reviewer, IEEE 22nd International Symposium on Biomedical Imaging (ISBI 2025) 2024 – 2025

Master's Thesis Co-supervisor, IIT Kharagpur, India 2023 – 2025

Workshop Organizer, ICPR-2024 on Sustainable Pattern Recognition and CV Developments. 2024

Special Issue Journal Editor, Nordic Machine Intelligence (NMI) Journal 2023. 2023 – 2024

Program Chair, 29th International Conference on Neural Information Processing, New Delhi. 2022 – 2022

President, Society of Industrial and Applied Mathematics, IIT ISM Student Chapter. 2019 – 2021

Founder and Mentor, SIAM Coding Classes, IIT ISM Dhanbad. 2018 – 2020

UNDERVISNINGSERFARING

PhD Course Coordinator and Lecturer

2023 – 2024

Secured individual grants from the Norwegian Artificial Intelligence Research Consortium (NORA) and Digital Life Norway (DLN) for summer school on the importance of interpretability, ethics, and transparency in deep learning.

Invited Guest Lecturer, Arctic Ecosystem Genomics, Skibotn Fieldstation, Norway

Desember 2023

Presented "Learning LLMs and Generative AI Landscape for Biological Research", organized by UiT Aurora Centre and The Arctic University Museum of Norway.

Invited Speaker, INTPART Nano-SymBioSys Workshop, Norway

September 2022

Delivered a talk at a workshop on Convergence of Microscopy, Spectroscopy, Nanotechnology, and AI for Bio-imaging, as part of a collaboration between Harvard University, IIT Delhi, and UiT Tromsø.