André **Pedersen**

Senior Machine Learning Engineer · Research Scientist · PhD Candidate

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Summary

Open-source advocate motivated by accelerating R&D through developing solutions people actually use. 6+ years experience using machine learning frameworks like TensorFlow. 5+ years experience in Python and 3+ years experience C++ software development. Strong theoretical background and practical repertoire in topics such as 3D computer vision, deep learning, real-time video recognition, natural language processing, and high-performance computing. Established researcher with 18 published research articles and 2 open annotated image dataset contributions.

Education

Norwegian University of Science and Technology (NTNU)

Trondheim, Norway

PhD in Medical Technology - Artifical Intelligence for Breast Cancer Prognostication

Oct. 2019 - Oct. 2023

- Submitting thesis Apr. 2024.
- Published 3 papers as part of thesis. 16 journal publications, 1 conference paper, and 1 book chapter in thesis period.

UiT: The Arctic University Norway

Tromsø, Norway

MSc in Applied Physics and Mathematics - specialization in machine learning & statistics

Aug. 2014 - Jun. 2019

- Industry project together with SINTEF on domain agnostic AI solutions for cancer diagnostics.

Skills

ML/DL	TensorFlow, Keras, PyTorch, Lightning, OpenAI, Vanna, scikit-learn, TensorFlow Lite, TensorRT, OpenVINO, Stable Baseline3
Tools	Git, GitHub Actions, Docker, Hugging Face Spaces, MS Azure, Gradio, Streamlit, Flask, Qt5, Flutter, PyInstaller, CMake, NSIS
Programming Languages	Python, C++, Dart, R
	Norwegian (Native), English (Fluent), French (basic)

Experience

Sopra Steria, Applications

Trondheim, Norway

Senior Machine Learning Engineer

Oct. 2023 - Present

- Data scientist in industry project with Equinor developing a multimodal chatbot using Azure OpenAI, Flask, and Streamlit.
- Senior software developer in research project with the UNICAN team at NTNU to develop no-code AI solutions for digital pathology.
- Developed web applications for 2 medical image analyis solutions and 2 chatbots using Gradio/Streamlit and Hugging Face Spaces (demos).

SINTEF, Health Research

Trondheim, Norway

Research Scientist

May 2022 - Nov. 2023

- Key contributor to the FastPathology open software project in C++ using Qt5 and FAST (code).
- DevOps responsible for open-source clinical software, Raidionics, enabling automatic segmentation of pre- and postoperative brain tumors and generation of standardized clinical report (website, code).
- Developed open software plugin enabling cloud-based deployment of AI-solutions for digital pathology (code).
- Developed 4 applications demonstrating AI-based medical 3D image segmentation, using Gradio and hosted on Hugging Face Spaces (demos).
- Consulted on numerous research projects and grant applications, either through tutoring colleagues, implementing components in algorithm or deployment design, statistical analysis in assessment of trained models, or development of accessible technologies.
- Developed open python package to enable gradient accumulation in TensorFlow 2 (code).
- Codeveloped a python package to enable rapid stain normalization for histopathological images, supporting PyTorch, TF, and NumPy (code).

SINTEF, Health Research

Trondheim, Norway

Master of Science

Jan. 2019 - May 2022

- Lead SINTEF-funded project to enable code-free development and deployment of deep segmentation models for computational pathology (paper) - trained pathologist with no background in programming or deep learning to train and deploy his own convolutional neural networks for semantic segmentation of gigapixel histopathological images.
- Contributed to several funding applications on various topics with focus on software as a medical device and use of AI for medical applications. Contributed strongly to the AI, software, and statistics work packages, of which multiple achieved funding from the Norwegian Research Council.
- Performed statistical analysis and aided in method development and consulted in research activities, mainly focused on machine learning and computer aided designs, such as: 1) Supervised segmentation of brain tumors in MRIs - 5 separate papers (ex: paper), 3) Unsupervised detection of adverse events from free-text (paper), & 4) Responsible for statistical analysis for nanobubble-guided cancer treatment study (paper).

SINTEF, Health Research

Trondheim, Norway

Summer Internship

Jun. 2018 - Aug. 2018

- Implemented algorithms and trained AI models for semantic segmentation of medical volumetric data (CT) using TensorFlow.

Teaching

NTNU/SINTEF — *Trondheim, Norway*

Supervisor — *Jan. 2020 - Present*

- Main supervisor of 3 and co-supervisor of 2 Master's students with background in Computer Science and Electrical Engineering from NTNU.
- Technical contributor to 5 PhD Candidate projects at ISB/IKOM/IDI at NTNU.

UiT: The Artic University of Tromsø — *Tromsø, Norway*

Student Teaching Assistant — *Aug. 2017 - Nov. 2018*

- Held programming workshops in Python/MATLAB, each fall 2017 and 2018 for the courses: FYS-1001 Mechanics and FYS-2006 Signal Processing.

Awards

2022 **Best poster award**, Central Norway Regional Health Authority — *Stjørdal, Norway (Virtual)*
`https://www.youtube.com/watch?v=rLItNztlay0&t=25546s`

Certificates

2024 **Generative AI with Large Language Models**, DeepLearning.AI — *Online Exam*
`https://www.coursera.org/account/accomplishments/verify/GTFN2BBZC2SK`

2024 **Microsoft Certified: Azure Data Fundamentals**, Microsoft — *Online Exam*
`https://learn.microsoft.com/en-us/users/andreped/credentials/35A98395F0A43745`

2023 **Generative AI For Everyone**, DeepLearning.AI — *Online Exam*
`https://www.coursera.org/account/accomplishments/verify/SQGX4CAYVRYP`

2023 **TensorFlow Developer Certificate**, Google — *Online Exam*
`https://www.credential.net/24a998b0-da8e-4c9e-aaf7-23cd2bfd06b3`

2023 **Microsoft Certified: Azure AI Fundamentals**, Microsoft — *Online Exam*
`https://learn.microsoft.com/en-gb/users/andreped/credentials/cce910202116c269`

Preprints

Immunohistochemistry guided segmentation of benign epithelial cells, in situ lesions, and invasive epithelial cells in breast cancer slides (paper, code) — *arXiv*

M Høibø, A Pedersen, V G Dale, ..., M Valla — *Nov. 2023*

AeroPath: An airway segmentation benchmark dataset with challenging pathology (paper, code, demo) — *arXiv*

K-H Støverud, D Bouget, A Pedersen, ..., E F Hofstad — *Nov. 2023*

Book Chapters

Artificial Intelligence in Studies of Malignant Tumours - Book: Biomarkers of the Tumor Microenvironment: Basic Studies and Practical Applications Springer — *Book Chapter*

Lead Writer — *Jan. 2020 - Jan. 2021*

- Contributed book chapter in now published book (paper).

Publications

Growth dynamics of untreated meningiomas (paper, code) — *Neuro-Oncology Advances*

P O Sveino, K J Wågø, A Pedersen, ..., & O Solheim — *Des. 2023*

Segmentation of glioblastomas in early post-operative multi-modal MRI with deep neural networks (paper, code) — *Scientific Reports*

R H Helland, A Ferles, A Pedersen, ..., & D Bouget — *Nov. 2023*

Raidionics: an open software for pre- and postoperative central nervous system tumor segmentation and standardized reporting (paper, code) — *Scientific Reports*

D Bouget, ..., A Pedersen, O Solheim, & I Reinertsen — *Sept. 2023*

Learning deep abdominal CT registration through adaptive loss weighting and synthetic data generation (paper, demo, code)
J Pérez De Frutos, A Pedersen, E Pelanis, ..., & F Lindseth
PLOS ONE
Feb. 2023

H2G-Net: A multi-resolution refinement approach for segmentation of breast cancer region in gigapixel histopathological images (paper, code, demo)
A Pedersen, E Smistad, T V Rise, ..., & M Valla
Frontiers in Medicine
Sep. 2022

Teacher-student approach for lung tumor segmentation from mixed-supervised datasets (paper, code, demo)
V Fredriksen, S O M Svele, A Pedersen, ..., & F Lindseth
PLOS ONE
Apr. 2022

Mediastinal lymph nodes segmentation using 3D convolutional neural network ensembles and anatomical priors guiding (paper, code)
D Bouget, A Pedersen, J Vanel, H O Leira, & T Langø
CMBBE
Mar. 2022

Preoperative Brain Tumor Imaging: Models and Software for Segmentation and Standardized Reporting (paper, code)
D Bouget, A Pedersen, A S Jakola, ..., & I Reinertsen
Frontiers in Neurology
Jan. 2022

Code-Free Development and Deployment of Deep Segmentation Models for Digital Pathology (paper, code)
H S Pettersen, I Belevich, E S Røyset, ..., & A Pedersen
Frontiers in Medicine
Jan. 2022

Preliminary Processing and Analysis of an Adverse Event Dataset for Detecting Sepsis-Related Events (paper, code)
M Yan, L H Høvik, A Pedersen, ..., & Ø Nytrø
IEEE BIBM 2021
Des. 2021

Meningioma segmentation in T1-weighted MRI leveraging global context and attention mechanisms (paper, code)
D Bouget, A Pedersen, S A M Hosainey, ..., & I Reinertsen
Frontiers in Radiology
Sep. 2021

Glioblastoma Surgery Imaging-Reporting and Data System: Validation and Performance of the Automated Segmentation Task (paper, code)
D Bouget, R Eijgelaar, A Pedersen, ..., & P C De Witt Hamer
Cancers
Sep. 2021

Glioblastoma Surgery Imaging—Reporting and Data System: Standardized Reporting of Tumor Volume, Location, and Resectability Based on Automated Segmentations (paper, code)
I Kommers, D Bouget, A Pedersen, ..., & P C De Witt Hamer
Cancers
Jun. 2021

FastPathology: An open-source platform for deep learning-based research and decision support in digital pathology (paper, code)
A Pedersen, M Valla, A M Bofin, ..., & E Smistad
IEEE Access
May 2021

Fast meningioma segmentation in T1-weighted MRI volumes using a lightweight 3D deep learning architecture (paper, code)
D Bouget, A Pedersen, S A M Hosainey, O Solheim, & I Reinertsen
Journal of Medical Imaging
Mar. 2021

Sonopermeation Enhances Uptake and Therapeutic Effect of Free and Encapsulated Cabazitaxel (paper, code)
S Snipstad, Ý Mørch, E Sulheim, A Åslund, A Pedersen, ..., & S Berg
Ultrasound in Medicine & Biology
Feb. 2021

High performance neural network inference, streaming, and visualization of medical images using FAST (paper, code)
E Smistad, A Østvik, & A Pedersen
IEEE Access
Des. 2019