Max Andersson

Software and Machine Learning Engineer

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Building innovative, efficient, high-performance software solutions for real-world impact!

Technical Skills

Programming Languages: Python, C++, Kotlin, SQL, R, JavaScript, MATLAB, TypeScript, LaTeX

Frameworks: PyTorch, TensorFlow, Scikit-learn, MLflow, React, Git, Docker

Domains: AI, Machine Learning, MLOps, Computer Vision, Automation, GUI, Anomaly Detection

Experience

Software Engineer and Physics Researcher *February 2025 - Present*
CERN *Geneva, Switzerland*

- Optimized and automated DAQ software, saving 600 hours per year.
- Identified and optimized oscilloscope-PC communication bottleneck, reducing TCT measurement time by 80%.
- Supervised and mentored a student on technical, theoretical, and workflow aspects.
- Developed **PENGUIN**, a Python-based environment for GUI-driven analysis using Pyside6 and Git. Enabled real-time data synchronization from 4500+ measurements with one-click access to analysis results. PENGUIN empowers effective collaboration within a team of 6, streamlining workflows and saving individual analysis hours.
- Conducted annealing studies of neutron irradiated p-type silicon diodes for the CMS HGCAL endcap upgrade. Provided novel knowledge of the expected electrical characteristics of the silicon sensors during the 10-year operation of HL-LHC.

Machine Learning Engineer *July 2024 - September 2024*
CERN *Geneva, Switzerland*

- Developed and enhanced Computer Vision ML models for anomaly detection in silicon sensor quality control.
- Combined four individual software programs to one user-friendly GUI. Developed grid scan algorithm to automatically align laser to the opening of silicon diodes.
- Enrolled in CERN Summer Student Programme (2.3 % acceptance rate). Lectures in Quantum Computing, GPU Programming, Reinforcement Learning, and Particle & Detector Physics.

Full-Stack Developer *June 2023 - December 2023*
Ericsson *Gothenburg, Sweden*

- Developed an end-to-end software tool using HTML/CSS, JavaScript, Python, and Docker to communicate with 3G, 4G and 5G cells, monitoring and modifying its live status, range and bearing. Project presented to the CEO.
- Developed an Android app in Kotlin to monitor serving and secondary 3G/4G/5G cells, implemented real-time streaming via MQTT protocol, and created a heatmap feature to optimize connection coverage.

Automated Assembly Line Operator *Oct 2019 - Aug 2022*
Charkuterifabriken Sverige AB *Halmstad, Sweden*

- Optimized and led the production line to ensure maximum efficiency for a 12-person team.
- Quickly identified and resolved mechanical issues to minimize production downtime.

Event Coordinator *Sep 2021 - Nov 2021*
Uppsala Union of Engineering and Science Students *Uppsala, Sweden*

- Coordinated pre-fair events for UTNARM, a major career fair with 100+ exhibiting companies.
- Led planning and logistics for two event weeks preceding the fair.
- Moderated a panel discussion with five professors with an audience of 230 attendees.

Education

M.Sc. Engineering Physics, Computer Science and AI *August 2020 - January 2026*
Uppsala University *Uppsala, Sweden*

- **Computer Science:** Machine Learning, Deep Learning (advanced), Algorithms, Scientific Computing, Databases
- **Physics:** Quantum Physics, Electromagnetism, Solid State Physics, Mechanics, Special Relativity
- **Mathematics:** Partial Differential Equations, Transform Methods, Linear Algebra, Optimization, Statistics
- **Engineering:** Robotics, Automatic Control, Electronics, Signals and Systems
- **GPA:** 4.74 / 5.00
- **Awards:** Carlson, H. W. Scholarship
- **Bachelor Thesis:** Dark Matter signals at the Large Hadron Collider with Deep Learning
  - Simulated proton-proton collisions with Monte Carlo simulation using MadGraph and MadAnalysis on HPC clusters and classified the possible dark matter candidates using deep learning models.

International Studies in AI *January 2024 - July 2024*
Ghent University *Ghent, Belgium*

- **Courses:** Large Language Models, Natural Language Processing, Causal Machine Learning, Deep Generative Models

Engineering Preparatory Year *Aug. 2018 - Jun 2019*
Lund University *Lund, Sweden*

Economics and Management *Aug. 2015 - Jun 2018*
Aspero Sports High School *Halmstad, Sweden*

- Founded and managed a student company as part of the Junior Achievement / Ung Företagsamhet programme, gaining experience in entrepreneurship, budgeting, and marketing.

Publications

Exploiting the Asymmetric Uncertainty Structure of Pre-trained VLMs on the Unit Hypersphere *2025*

- **Journal:** NeurIPS
- **Keywords:** Vision Language Models, Uncertainty Quantification, Multimodal, Contrastive Learning

Temperature dependence of the long-term annealing behavior of neutron irradiated diodes from 8-inch p-type silicon wafers *2025*

- **Journal:** JINST
- **Keywords:** Radiation Damage, Silicon Sensors, Annealing, CMS, HGCAL

Soft Skills & Language Skills

Soft skills: Leadership, Innovative Thinking, Time Management, Effective Communication, Team Collaboration
Languages: Swedish (fluent), English (fluent), Spanish (B1), French (A1)