

Ali Beikmohammadi

Senior AI Engineer — AI & Automation Center for Enablement · Sandvik / Seco Tools AB

PhD Researcher — Computer and Systems Sciences · Stockholm University (DSV)

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PROFILE

Senior AI Engineer and formally trained ML engineer with 7+ years designing, deploying and operationalising production-grade machine learning and generative AI systems, alongside a PhD in reinforcement learning and distributed optimisation. Track record of leading cross-functional initiatives and collaborating with industry and research partners to deliver scalable AI across industrial, product and enterprise domains. Strong focus on ML platforms, MLOps and distributed systems, with hands-on experience spanning computer vision, agentic AI and large-scale LLM pipelines.

EXPERIENCE

Senior AI Engineer

Jun 2025 — Present

Sandvik / Seco Tools AB — AI & Automation Center for Enablement · Stockholm, Sweden

AI enablement, strategy and cross-org delivery

- Core contributor to the AI Center for Enablement, acting as an internal AI consultant — defining how AI is scoped, delivered and operationalised across HR, L&D, Operations, Finance, Global Supply Chain, IT, Sales Operations, R&D and Logistics.
- Led AI initiative intake and use-case discovery: problem definitions, feasibility assessments, roadmaps and execution plans across multiple domains.
- Bridged business leadership, product owners and platform teams to align AI initiatives with strategic objectives and data readiness.

Platform and MLOps ownership

- Drove adoption of scalable MLOps patterns across Azure ML and Databricks — MLflow-based experimentation, model registry practice, Vector Search, RAG architectures and Unity Catalog.
- Authored internal standards and guidelines for CI/CD for ML, model lifecycle management and deployment readiness.
- Worked with DevX and platform teams to improve reliability, monitoring, reproducibility and governance of production ML systems.

Agentic AI, conversational systems and automation

- Led design and delivery of several production agent-based systems on Microsoft Copilot Studio, Databricks and Azure, serving customer-facing, sales, operational and HR audiences. Representative examples:
- **Customer-facing product discovery** — a public web assistant grounded in product databases, technical documentation and marketing content, supporting product selection and customer support.
- **Manufacturing diagnostics** — a shop-floor assistant for diagnosing machine and process errors, built with domain experts and grounded in troubleshooting documentation.
- **Sales enablement** — an assistant surfacing verified facts, references and case material to support outreach to prospective customers.
- **Learning and development** — an HR assistant mapping competency gaps and recommending personalised learning paths against an established 70/20/10 framework.
- Integrated agents with Power Automate, evaluated trade-offs between traditional RPA and agentic automation, and documented licensing, governance and operational best practice.

Product intelligence, generative AI and content automation

- Led an AI-driven product description initiative generating short and long descriptions across a catalogue of 35,000+ products using LLM-based pipelines.
- Designed and implemented scalable data and generation workflows in Databricks and Azure, integrating structured product data with unstructured marketing content.
- Defined extensive business rules, quality guidelines and validation logic to ensure brand consistency, regulatory compliance and output quality.
- Collaborated with product, marketing and IT to operationalise live content generation and continuous updates.

Industrial computer vision — automated tool wear inspection

- Technical lead, owning the end-to-end computer vision pipeline from data annotation and dataset strategy through model development to cloud deployment.
- Designed and deployed object detection models (YOLO, Faster R-CNN) for automated visual inspection, replacing a manual inspection process.
- Drove large-scale annotation efforts: labelling guidelines, annotation workshops, quality assurance and dataset versioning practice.
- Contributed to the architecture blueprint, risk management, and functional and non-functional requirements, including migration of AI workflows to cloud infrastructure.

ML Research Engineer

Sep 2021 — Jun 2025

Stockholm University — Data Science Research Group · Stockholm, Sweden

Reliable adaptive predictive maintenance and intelligent decision support

With SCANIA CV AB and Linköping University

- Collaborated with cross-disciplinary teams — applied scientists, software engineers and analysts — to deliver ML solutions tied to business KPIs.
- Led development of a library and proposed MMK-means, a real-time inference clustering method handling up to 50% missing data while matching full-data K-means accuracy.
- Designed a novel cost-sensitive Transformer model, cutting truck braking system costs by 15%.
- Oversaw implementation with a team of engineers and research scientists.

Mitigating toxicity and bias in large language models via reinforcement learning

With SINTEF AS and KTH

- Developed a model-agnostic RL framework minimising toxicity across LLaMA, GPT, BERT and RoBERTa architectures.
- Evaluated with diverse toxicity metrics, achieving significant reductions in toxicity, profanity, sexually explicit content, flirtation, threats and insults.
- Ran fairness and bias mitigation experiments, demonstrating improved inclusivity and fairness scores in generated output.

AI-based control and coordination for smart converters

With Hitachi Energy and KTH

- Developed a multi-agent deep RL (MADDPG) system for smart converters.
- Enhanced actor-critic models with Accelerated-TD3, achieving a 200% improvement in learning efficiency by integrating prior knowledge.
- Pioneered a communication-efficient federated learning framework for MARL, improving collaboration efficiency 40×.
- Investigated finite-sample convergence of federated algorithms including error-feedback FedProx and FedAvg, achieving 80% faster convergence without data similarity.
- Examined non-asymptotic convergence of distributed momentum methods under biased gradient estimation from compression and clipping.

Deep reinforcement learning for sustainable power systems

With KTH and the University of California

- Created a PPO-based deep RL model for sustainable power systems, reducing energy consumption by 16%.
- Designed a new Gymnasium-based environment for evaluating multi-agent RL algorithms, shortening development cycles.
- Introduced TA-Explore, a novel exploration strategy accelerating convergence in simulation by 150%.

Teaching and supervision

- Supervised 30+ Master's students in AI and Health Informatics at Stockholm University and Karolinska Institutet, applying deep learning, Transformers, multimodal and reinforcement learning across healthcare, forecasting, recommender systems, network optimisation, planning, agriculture and fairness.
- Developed a new MSc course in Reinforcement Learning — built the teaching material from scratch and designed and ran five laboratory sessions for the first cohort. 187 students.
- Course instructor — Current Research and Trends in Health Informatics, focusing on time-series analysis, deep learning methodology and reinforcement learning. 91 students.

Visiting PhD Student

Sep 2022 — Nov 2022

Universitat Pompeu Fabra (UPF) — Artificial Intelligence and Machine Learning Research Group · Barcelona, Spain

- Explored Reward Machines to facilitate cooperative learning in MARL, increasing collaboration efficiency, beneficial for complex system simulations.
- Explored transfer learning from single-agent to MARL, enhancing learning speed by 60%, enabling faster model deployment.

Data Scientist

Sep 2019 — Sep 2021

MCI — Iran's largest telecommunications operator, 60M+ subscribers · Tehran, Iran

Fraud detection and risk assessment

- Led an ML team of six for over six months, working with product, design, data scientists and engineering managers to scope initiatives using ML — including problem definition specifications and stakeholder management.
- Built pipelines for collection, preprocessing, feature engineering, training, evaluation, deployment and batch inference, cutting false positives 40%, avoiding roughly \$1M in losses and reducing implementation time 30%.
- Created a zero-to-one specification for comprehensive risk assessment across multiple business entities.
- Built prototypes and demonstrations using MLOps principles — CI/CD pipelines, automated workflows and containerisation with Kubernetes and Docker — to streamline deployment, monitoring and troubleshooting of production ML at scale.

Customer churn prediction

- Led initiatives to identify performance gaps, then co-designed and rolled out a system using CatBoost, LightGBM, XGBoost and Random Forest, improving prediction accuracy 12%.
- Addressed data imbalance with SMOTE and ADASYN, producing more robust performance on minority classes.
- Contributed content, teaching and tutoring for internal data and ML training programmes, and led ML reading groups across teams and product areas.

Supply chain optimisation

- Built and serviced an order lead-time prediction system using linear regression, decision tree regression and gradient boosting, reducing lead-time variance 25%.
- Scaled ML deployments for large-scale data processing and transactions, troubleshooting deployment issues to hold 99.999% uptime.
- Onboarded team members from junior to staff level and mentored engineers on leading initiatives — problem scoping, test specifications and defining deliverables.

EDUCATION

PhD in Computer and Systems Sciences

Sep 2021 — Oct 2026

Department of Computer and Systems Sciences (DSV), Stockholm University · Stockholm, Sweden

Thesis: Toward Sample-Efficient Reinforcement Learning: Theoretical Foundations and Algorithms

Defence scheduled 16 October 2026. Coursework: Reinforcement Learning, Artificial General Intelligence, Majorize-Minimization Optimization with ML Applications, High Performance Computing.

MSc in Electrical Engineering — Digital Electronic Systems

Sep 2017 — Sep 2019

Amirkabir University of Technology · Tehran, Iran

Thesis: Improvement of Leaf Classification for Plant Identification Using Deep Learning — 20 / 20 (A+) — ranked 1st in cumulative GPA

Coursework: Machine Learning, Neural Networks, Deep Learning, Statistical Pattern Recognition, Machine Vision.

BSc in Electrical Engineering — Electronics

Sep 2013 — Jul 2017

Bu-Ali Sina University · Hamedan, Iran

Thesis: A New Approach to Automatic Iranian License Plate Recognition Based on Template Matching Using Computer Vision — 20 / 20 (A+) — ranked 1st in cumulative GPA

Coursework: Calculus, Algebra, Statistics & Probability

HONOURS AND AWARDS

- **2025** — Rhodins, Elisabeth and Herman, Memory Scholarship
- **2025** — Lars Hierta Memorial Foundation Scholarship
- **2024** — Rhodins, Elisabeth and Herman, Memory Scholarship
- **2019** — Outstanding Paper Award, 5th ICSPIS'19 conference
- **2019** — Selected as a talented student for direct PhD admission in Electrical Engineering (no entrance exam) (Iran National Elites Foundation & Amirkabir University of Technology)
- **2019** — Ranked 1st in cumulative GPA among all Electrical Engineering MSc students (Amirkabir University of Technology — GPA 19.77 / 20)
- **2017** — Selected as a talented student for direct MSc admission (no entrance exam) (Tarbiat Modares University, Shahid Beheshti University, and Iran University of Science and Technology)
- **2017** — Ranked 1st in cumulative GPA among all Electrical Engineering BSc students (Bu-Ali Sina University — GPA 19.10 / 20)
- **2017–2021** — Member, Iran National Elites Foundation
- **2015–2017** — Selected as an educational talented student, three consecutive years (Bu-Ali Sina University)
- **2015–2016** — Board member, Scientific Association of Electricity (Bu-Ali Sina University)

SELECTED PUBLICATIONS

878 citations · h-index 11 · i10-index 14 (Google Scholar, 14 Sep 2026) · 38 publications in total

1. **Ali Beikmohammadi**, Mohammad Hosein Hamian, Neda Khoeyniha, Tony Lindgren, Olof Steinert, Sindri Magnússon. "A Cost-Sensitive Transformer Model for Prognostics Under Highly Imbalanced Industrial Data." *Cluster Computing* 29(6), 345, 2026.
2. **Ali Beikmohammadi**, Sarit Khirirat, Sindri Magnússon. "Collaborative Value Function Estimation Under Model Mismatch: A Federated Temporal Difference Analysis." *ECML-PKDD*, 2025 [Top 24% of submissions].
3. **Ali Beikmohammadi**, Sindri Magnússon. "Human-inspired framework to accelerate reinforcement learning." *The Journal of Supercomputing*, 2025.
4. **Ali Beikmohammadi**, Sarit Khirirat, Sindri Magnússon. "Parallel Momentum Methods Under Biased Gradient Estimations." *IEEE Transactions on Control of Network Systems*, 2025.
5. **Ali Beikmohammadi**, Sarit Khirirat, Sindri Magnússon. "Compressed Federated Reinforcement Learning with a Generative Model." *ECML-PKDD*, 2024 [Top 24% of submissions].
6. **Ali Beikmohammadi**, Sindri Magnússon. "Accelerating actor-critic-based algorithms via pseudo-labels derived from prior knowledge." *Information Sciences*, 2024.
7. **Ali Beikmohammadi**, Sarit Khirirat, Sindri Magnússon. "On the Convergence of Federated Learning Algorithms without Data Similarity." *IEEE Transactions on Big Data*, 2024.
8. **Ali Beikmohammadi**, Sindri Magnússon. "TA-Explore: Teacher-assisted exploration for facilitating fast reinforcement learning." *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2023.
9. **Ali Beikmohammadi**, Karim Faez, Ali Motalebi. "SWP-LeafNET: A novel multistage approach for plant leaf identification based on deep CNN." *Expert Systems with Applications*, 2022.

Full list: 16 journal articles, 20 peer-reviewed conference papers, 2 books.

TEACHING AND SUPERVISION

16 courses taught or assisted; 28 Master's theses (35 students) supervised, 9 as main supervisor.

- Reinforcement Learning — Lab instructor, Fall 2025, Department of Computer and Systems Sciences (DSV), Stockholm University
- Current Research and Trends in Health Informatics — Lecturer, Fall 2025, Joint Programme in Health Informatics, Karolinska Institutet & Stockholm University
- Reinforcement Learning — Course developer, Fall 2024, Department of Computer and Systems Sciences (DSV), Stockholm University
- Current Research and Trends in Health Informatics — Lecturer, Fall 2024, Joint Programme in Health Informatics, Karolinska Institutet & Stockholm University
- Current Research and Trends in Health Informatics — Lecturer, Fall 2023, Joint Programme in Health Informatics, Karolinska Institutet & Stockholm University
- Current Research and Trends in Health Informatics — Lecturer, Fall 2022, Joint Programme in Health Informatics, Karolinska Institutet & Stockholm University

ACADEMIC SERVICE

- Organizing Team Member — 2025 IEEE World Congress on SERVICES (SERVICES 2025) (2025)
- Local Chair — Symposium on Intelligent Data Analysis (IDA 2024) (2024)
- Organizing Team Member — 4th Iranian Conference on Signal Processing and Intelligent Systems (ICSPIS 2018) (2018)

Reviewer for: IEEE/ACM Transactions on Networking, IEEE Communications Letters, Information Sciences, Expert Systems with Applications, Neural Networks, Pattern Analysis and Applications, Journal of Big Data, Artificial Intelligence Review, Mobile Networks and Applications, Frontiers in Plant Science, The Imaging Science Journal, The Journal of Supercomputing, Engineering Applications of Artificial Intelligence, BMC Medical Imaging, Cluster Computing, Complex Systems Informatics and Modeling Quarterly, NeurIPS, ICLR, ECML-PKDD, ECAI, IJCNN, ECC.

TECHNICAL SKILLS

Languages & Scripting	Python, CUDA, OpenMP, MPI, MATLAB, Bash
ML & AI Frameworks	PyTorch, TensorFlow, Keras, Scikit-learn, Ray Tune
MLOps	MLflow, TensorFlow Serving, Flyte, Azure ML, Unity Catalog
Data & Distributed Systems	SQL, PostgreSQL, MySQL, MongoDB, Kafka, Spark, Hadoop, Hive
Cloud & HPC	Microsoft Azure, Databricks, Power Platform, Copilot Studio, Power Automate, HPC clusters
DevOps & CI/CD	Docker, Kubernetes, Git, GitHub Actions, GitLab CI/CD, Azure DevOps
Analysis & Visualisation	Pandas, Seaborn, Plotly, Matplotlib, Power BI

CERTIFICATIONS

- Power Automate RPA Developer Associate (PL-500) — course completion — LinkedIn Learning (Aug 2026)
- Power Platform Solution Architect Expert (PL-600) — course completion — LinkedIn Learning (Aug 2026)
- Microsoft Azure AI Essentials Professional Certificate — Microsoft (Jul 2026)

- Agent Evaluation on Databricks — Databricks (Jul 2026)
- Building Agentic Applications on Databricks — Databricks (Jul 2026)
- Fine-Tuning Large Language Models — Databricks (Jul 2026)
- Advanced Machine Learning Operations — Databricks (Feb 2026)
- Create Agents with Microsoft Copilot Studio — Online Workshop — Microsoft (Jul 2025)

48 credentials in total: 13 microsoft & power platform, 26 databricks — data, ml and genai, 5 generative ai & copilot productivity, 4 tools & other. Full list at <https://alibeikmohammadi.github.io/engineering.html>

OPEN-SOURCE SOFTWARE

- **Accelerated-Actor-Critic**
- **TA-Explore**
- **FedAlgo_WO_DataSim**
- **DistributedSGDM**
- **CompFedRL**
- **FedRL**
- **OpenNARS-for-Applications** — General reasoning component for applications based on NARS theory.
- **Cost-Sensitive-Transformer-Model** — Cost-Sensitive Transformer Model for Prognostics and Health Management
- **MultimodalPlantClassifier** — Source code for the master's thesis by Alfreds Lapkovskis & Natalia Nefedova (2024): Advancements in Agriculture: Multimodal Deep Learning for Enhanced Plant Identification. Developing a Multi-organ Plant Classifier Using Multimodal Fusion Architecture Search
- **ML4TransferIntegral**