# Alireza Nik | PhD Student

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## Work Experience

### Simula Metropolitan Center for Digital Engineering (SimulaMet) — Oslo, Norway
*Ph.D. Student (Full-time), Affiliated with Oslo Metropolitan University* — *Nov 2023 – Present*

As part of the Holistic Systems department, I study the computational and energy bottlenecks of generative AI models and develop techniques to optimize their inference across different hardware platforms. I explore how design choices influence inference efficiency and develop methods to reduce computational costs while maintaining reliability and practicality. This research aims to make AI more accessible and sustainable by enabling efficient deployment of large models in resource-constrained and latency-sensitive applications.

### Schlumberger (SLB) — Oslo, Norway
*Data Scientist (Full-time)* — *Sep 2022 – Oct 2023*

- Developed ML solutions for subsurface applications, ensuring high-quality model inputs through comprehensive data preprocessing and feature engineering pipelines.
- Applied natural language processing techniques to extract actionable insights from unstructured sources, including scanned well drilling and completion reports.
- Built and deployed computer vision models for automated inspection and monitoring of equipment and infrastructure in the oil and gas industry, improving operational efficiency and safety.

### Simula Metropolitan Center for Digital Engineering (SimulaMet) — Oslo, Norway
*Master Thesis Student (Full-time)* — *Feb 2022 – July 2022*

**Title:** The Generation of Synthetic Tabular Healthcare Data Using Deep Neural Networks.

- Conducted comprehensive research on synthetic tabular medical data quality, surveying existing evaluation metrics and implementing preprocessing pipelines for multiple healthcare datasets.
- Performed systematic experiments comparing tabular GAN architectures and configurations, developing an evaluation framework to assess synthetic medical data quality across various metrics.

### DNV AS — Oslo, Norway
*Summer Intern Student* — *May 2021 – Sep 2021*

- Conducted comprehensive analysis of equipment and maintenance practices using Key Performance Indicators to identify operational improvement opportunities at a prominent Norwegian oil and gas company.
- Developed an information retrieval model and optimization software to process reliability and maintenance data from SAP systems, enhancing maintenance strategies and operational reliability.

### AminFarkhani & Partners Exchange — Tehran, Iran
*Information Technology Specialist* — *Oct 2017 – Sep 2018*

- Performed necessary R&D to identify the right technologies for supporting company business.
- Actively contributed to the development of the existing IT landscape, work processes and digitization initiatives.

## Education

### Oslo Metropolitan University (OsloMet) — Oslo, Norway
*Doctor of Philosophy (Ph.D.), at the Faculty of Technology, Art and Design (TKD)* — *Nov 2023 – Nov 2026*

**Thesis:** Efficient AI Inference: Balancing Performance, Energy, and Resource Utilization in AI Systems

**Coursework:** Topics in AI and ML; Generative Modeling; Multi-modal Learning; Scientific Research Methods and Data Analysis in Engineering Science; Engineering Science and Ethics.

### University of Stavanger (UiS) — Stavanger, Norway
*Master's Degree in Computational Engineering* — *Sep 2019 – June 2022*

**Thesis:** The Generation of Synthetic Tabular Healthcare Data Using Deep Neural Networks.

**Coursework:** Modeling and Computational Engineering; Machine Learning; Data Mining and Deep Learning; Algorithm Theory; Image Processing and computer vision; Data-intensive Systems; Databases Systems; Modeling for Decision Insight.

### Shahid Rajaee University — Tehran, Iran
*Bachelor's Degree in Power Electrical Engineering* — *Sep 2011 – June 2016*

**Thesis:** The Implementation of the Genetic and PSO Algorithms for Solving a Typical Problem in Power Electrical Systems.

**Coursework:** Differential Equations; Engineering Mathematics & Statistics; Electromagnetic; Electric Circuits; Power System Analysis; Electronics; Principles of Micro-Controllers; Telecommunication; Signal Processing; Linear Control Systems.

## Technical Skills

**Areas of Expertise**: Generative AI, Deep Learning, NLP, High-Performance Computing, Edge Computing
**Programming**: Python, MATLAB, SQL, Bash, C/C++
**Frameworks & Tools**: Git/GitHub, Docker, PyTorch, Hugging Face, LangChain, vLLM PostgreSQL, MongoDB
**Languages**: English (Fluent), Norwegian (Intermediate)

## Research Interests

| AI Inference Optimization | Resource-Aware Computing | Efficient AI Systems | Sustainable AI |

| Distributed/Collaborative Inference |

## Publications

**2025**: Impact of Decoding Strategies on GPU Energy Usage in Large Language Model Text Generation. *Nature Scientific Reports*

**2025**: When Silence is Safer: A Review of LLM Abstention in Healthcare. *Under Review in Nature npj Digital Medicine*,

**2025**: A Comparative Study of Decoding Strategies in Medical Text Generation. *MMM 2026-International Conference on Multi-Media Modeling*

**2023**: Generation of Synthetic Tabular Healthcare Data Using Generative Adversarial Networks. *MMM 2023-International Conference on Multi-Media Modeling*,

## Academic Training & Summer Schools

**2025**: Summer School on Multimodal learning - University of Østfold, Norway

**2024**: Summer School on High Performance Computing and Emerging Technologies - University of Trento, Italy

**2024**: Summer School on Generative Models - University of Agder, Norway

## Awards & Certifications

**Participant: Fundamentals of Accelerated Computing with CUDA C/C++ (2025)**: Issued by Nvidia

**Winner: Digital Innovation Hackathon (2023)**: Issued by SLB

**Participant: Cognite Data Fusion Bootcamp (2023)**: Issued by Cognite

**Participant: Software Development Practices (2022)**: Issued by SLB

**Participant: Machine Learning Practitioner Certificate (2022)**: Issued by Dataiku

## References

**Pål Halvorsen**: Head of Holistic Systems Department, SimulaMet, Norway
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**Michael Riegler**: Head of AI, Simula Research Laboratory, Norway
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