

NADER LOBANDI

CONTACT INFORMATION

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Google Scholar

EDUCATION

University of Denver, Ritchie School of Engineering & Computer Science

Expected May 2028

Ph.D. in Computer Science (GPA: 3.7)

Research areas: Deep Learning, Computer Vision, Foundation Models, Model Compression & Quantization, GPU Computing and CUDA Programming

Northeastern University, Khoury College of Computer Science

Mar 2021 - Dec 2024

M.Sc. in Data Science (GPA: 3.8)

Sharif University of Technology

Sep 2015 - Jul 2020

B.Sc. in Electrical Engineering

RESEARCH INTERESTS

- Deep Learning & Computer Vision
- Efficient Foundation Models
- Model Compression and Quantization
- Statistical & Applied Machine Learning
- Multimodal & Vision-Language Models
- Embodied & Multiparty AI

SELECTED COURSES

- Machine Learning and Pattern Recognition
- Supervised Machine Learning
- Unsupervised Machine Learning
- Advanced Algorithms and Data Structures
- Advanced Computer Vision
- Deep Learning
- Diffusion Models
- Operating Systems
- Statistical Inference
- Natural Language Processing
- Fundamentals of Computer Engineering
- Database Management Systems
- Shell Scripting & System Tools
- Data Management and Processing

RELEVANT EXPERIENCE

University of Denver

Denver, CO

Graduate Research Assistant

Mar 2026 - Present

- Efficient Foundation Models: Researching model compression, quantization, and hardware-aware optimization for on-device vision-language and multimodal inference, advised by Dr. Mohammad Mahoor. Building a benchmark dataset and efficient models for hardware e-waste detection and recovery in data centers, with CUDA-accelerated components
- Facial Expression Recognition: Designing vision architectures trained with soft labels on AffectNet+ to address ambiguity between overlapping expressions and demographic bias
- Embodied Multiparty AI: Designing multiparty perception for a social robot (AMUSE extension), fusing microphone-array sound direction with camera video to resolve who is speaking and who is being addressed, and benchmarking a geometry-grounded preference-optimization reward against DPO, PPO, and GRPO
- Speech Synthesis via Search: Developing a black-box search framework that clones voices onto frozen TTS models for a social robot, raising speaker-similarity fitness from 84.95 to 96.61 in 2,000 evaluations. The system is in production
- Digital Twin for Healthcare: Developing Digital Twin systems for Mild Cognitive Impairment (MCI) detection using multimodal deep learning

BeanSprout AI*Data Scientist**Boston, MA**Mar 2025 - Jun 2025*

- ML Pipeline & Deployment: Built a cardiovascular risk prediction model (LightGBM, XGBoost, AUC 0.89) and took it from data ingestion through hyperparameter tuning to deployment on Modal with MLflow tracking
- Speech & Agentic Workflows: Implemented real-time speech interaction using Vertex AI speech-to-text and text-to-speech, and designed agentic workflows for secure document access and intent routing

VHB (Vanasse Hangen Brustlin Inc.)*Data Scientist**Watertown, MA**Jan 2024 - Mar 2025*

- Big Data Analysis on Databricks: Analyzed terabytes of traffic big data using PySpark, SQL, and Delta Live Tables. Audited streaming feeds and found that over 70% of the data originated from an unreliable vendor
- LLM & RAG Chatbot: Deployed an internal chatbot using RAG and SQL execution to give project managers real-time access to employee hours, assignments, and reporting data via natural language queries
- Energy Demand Forecasting: Developed time series models using LSTM, Prophet, and SARIMA to forecast energy demand. Improved the accuracy of load predictions and supported peak reduction strategies for NYC Transit
- Vision-Based Traffic Safety: Built a real-time object detection and tracking pipeline using YOLO and Azure Vision to analyze live intersection feeds and flag near-miss incidents, optimizing inference latency to keep up with streaming video

Kibur Medical Inc.*Data Scientist Intern**Boston, MA**Jun 2023 - Sep 2023*

- Cloud ML for Biomedical Imaging: Built a bilateral filtering preprocessing pipeline for high-dimensional biomedical images, improving cell quantification accuracy by about 20%. Integrated AWS S3 for scalable, real-time image access

Northeastern University*Research Assistant**Boston, MA**Mar 2021 - Sep 2024*

- ML for Sensor Data: Trained and evaluated LSTM, GMM, and regression models on time-series sensor data for COVID-19 detection, reaching 95% recall. Built training pipelines in PyTorch. Published in IEEE Sensors Letters and Biosensors & Bioelectronics
- Statistical Signal Processing: Applied detection theory, including MAP, Bayesian, Neyman-Pearson, and minimax criteria, to separate true sensor response from background noise in low signal-to-noise biosensor measurements

SELECTED PROJECTS

- JobScout (Agentic Job Search): Built a multi-agent system with an orchestrator and specialist sub-agents for search, scoring, and drafting, backed by a custom MCP server that normalizes eleven job boards. Dealbreaker filtering stays in deterministic Python so untrusted postings cannot prompt-inject past it, and the human approval gate has no path to auto-submit. Built an LLM-as-judge evaluation harness against a hand-labeled golden set that includes an adversarial injection case. Stack: Python, Anthropic API, MCP SDK, Streamlit, Docker
- SecureFaceID: Built a face authentication system with liveness detection that runs on a standard RGB camera instead of depth or infrared hardware. Uses blink detection to reject photo and screen spoofing attempts, and stays accurate when the user is wearing a mask
- E-Waste Sustainability Assistant (Summit Hack 2026, 2nd Place, Colorado universities): Built a vision tool that identifies electronic waste from a photo and returns its carbon footprint, recoverable value, and disposal action. Implemented in Streamlit using Gemini 3 Flash for vision with strict JSON output, plus a heuristic decision engine with safety overrides
- Financial News Sentiment Analysis: Built an NLP system to classify sentiment in high-volume financial news. Benchmarked classical and transformer models across two datasets, with FinBERT at 0.73 accuracy and 0.74 macro-F1 on Alpha Vantage and BERT-uncased at 0.86 accuracy and 0.86 macro-F1 on Yahoo Finance

- Financial Time-Series Forecasting and Document Question Answering: Built a Streamlit tool for interactive backtesting of forecasting strategies with reliable horizons up to two months, using an AutoTS ensemble (VARMAX, NeuralProphet, ARIMA, Seq2Seq). Paired it with a RAG-based document retrieval and QA interface for querying 10-K filings using LangChain and LLaMA-3
- Deep Learning Image Classification: Developed convolutional neural network models with Batch Normalization and Dropout regularization for image classification, achieving 82.11% accuracy. Conducted comparative evaluation against KSVM and KNN baselines, with training optimization via early stopping and learning rate scheduling

TEACHING ASSISTANTSHIPS

• Essential Math for Data Science and AI and Engineering Programming , University of Denver	<i>Fall 2026</i>
• Data Visualization (COMP 4433) by Ben Siebrase , University of Denver	<i>Spring 2026</i>
• Analytical Inquiry I (COMP 1101) by Sky Gao , University of Denver	<i>Spring 2026</i>
• Circuits & Signals by Prof. Nick McGruer , Northeastern University	<i>Spring 2023 & Fall 2023</i>
• Electrical Engineering by Dr. Marvin Onabajo , Northeastern University	<i>Fall 2022</i>
• Fundamentals of Electronics by Dr. Marvin Onabajo , Northeastern University	<i>Spring 2022</i>

HONORS AND AWARDS

• 2nd Place, Summit Hack, Colorado Universities, 2026
• Recipient of the IAAP Scholarship Award, 2026
• Awarded the Gordon Institute of Engineering Leadership Fellowship, Northeastern University, 2024
• Recipient of the National Physics Olympiad Silver Medal, 2014
• Ranked in the top 0.1% out of 100,000 participants in University Entrance Exam for B.Sc. degree, 2015

LANGUAGES

• English	• Persian
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TECHNICAL SKILLS

Programming & ML Tools	Python (PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy), C++, CUDA/GPU Programming, SQL, R, Bash, OpenCV, PIL, PySpark, Hugging Face, ONNX, TensorRT, LangChain, MLflow, NLP, LLMs, RAG
Cloud & DevOps	Azure (Databricks), GCP, AWS, Docker, Git, Tableau
Engineering Tools	MATLAB, PSpice
Certifications	AI-102: Designing and Implementing a Microsoft Azure AI Solution (Microsoft, March 2024), 5-Day AI Agents Intensive Course with Google (Kaggle, June 2026)
Others	Adobe Photoshop, Adobe Illustrator, Adobe InDesign, L ^A T _E X

PUBLICATIONS

1. Sadeghi, P., Lobandi, N., Alshawabkeh, R., Rui, A., Sun, W. & Chen, J. Real-Time Detection of D-Glucose Molecules in Exhaled Aerosols Using a Biochemical Sensor for Breathalyzer Applications. *IEEE Sensors Letters* **9**, 1–4 (2025).
2. Burns, R., Wiechmann, A., Sadeghi, P., Lobandi, N., Fathy, N., Huang, R., Sun, N. X. & Mercier, P. *A 24.4 μW Room Temperature Gas Sensor Based on Molecularly Imprinted Polymers Demonstrating SARS-CoV-2 and D-Glucose Aerosol Sensing in 2024 IEEE Custom Integrated Circuits Conference (CICC)* (2024), 1–2.
3. Shi, X., Sadeghi, P., Lobandi, N., Emam, S., Seyed Abrishami, S. M., Martos-Repath, I. & Sun, N. X. Novel, Accurate Pathogen Sensors for Fast Detection of SARS-CoV-2 in the Aerosol in Seconds for a Breathalyzer Platform. *Biosensors and Bioelectronics: X* **14**, 100369. ISSN: 2590-1370 (2023).
4. Will-Cole, A. R., Hassanien, A. E., Caliskan, S. D., Jeong, M.-G., Liang, X., Kang, S., Rajaram, V., Martos-Repath, I., Chen, H., Risso, A., Qian, Z., Seyed Abrishami, S. M., Lobandi, N., Rinaldi, M., Gong, S. & Sun, N. X. Tutorial: Piezoelectric and Magnetoelectric N/MEMS—Materials, Devices, and Applications. *Journal of Applied Physics* **131**, 241101. ISSN: 1089-7550 (2022).

REFERENCES

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