

SUMMARY

Talented Computer Vision Engineer with a specialty in optimization, I have strong experience in developing and implementing state-of-the-art deep learning models. I am skilled in enhancing the performance of existing machine learning algorithms for real-world applications.

SKILLS

Python (various libraries like audiolazy, PyDynamic, lcapy, SciPy, super-gradients, IPOPT, imutils, robflow, pytube, Flask, DigitalOcean, easyocr, diffusers, OpenAI Gym, Pytorch lightning, regex, Pytorch geometric, tqdm, gym, imgaug, albumentations, Dlib, scikit-learn, scikit-image, Pillow, SimpleCV, OpenCV, Hugging Face, Civitai, DeepFace Xformers, torchvision), LangChain, lightrag-hku.

OpenAI API, Tensorflow, Pytorch, Pytorch Lightning R, Apache Spark, Java, Pyomo, PyCharm, Visual Studio, Spyder, Jupyter, Atom, Power BI, PyOD.

Tools: Heroku, Zeet, Django, Adaptable, AWS, React, runner, Pyomo, Ortools, PyCaret, SageMaker Studio, Tortoise-TTS, Wav2Lip, Bedrock, Boto3, GIMP. Lightning, UDACITY, NVIDIA Drive Sim, DeepWalk.

EDUCATION

Doctor of Computer Science

Sherbrooke University • Quebec, Canada • 2025 ~ Present

Master of Applied Science in Electrical and Computer Engineering

Concordia University • Montreal, Canada • 2021 ~ 2024

Master of Computer Engineering in Computer Systems Architecture

“Confirmed through Comparative Evaluation of Studies Conducted Outside Quebec” Islamic Azad University Science and Research Branch • Tehran, Iran • 2014 ~ 2017

Bachelor of Hardware Computer Engineering

Shomal University • Mazandaran, Iran • 2005 ~ 2008

Associate Degree in Computer- Hardware

Najafabad Institution for Higher Education • Isfahan, Iran • 2002 ~ 2005

Awards and Scholarships

Second Prize, Graduate Student Research Conference (GSRC), 2022

MITACS Research Internship Scholarship

Funded by VMware/Broadcom Canada

Excellence Scholarship

Awarded by the Fondation de l'Université de Sherbrooke

EXPERIENCE

PhD Researcher / DOMUS Lab/ Université de Sherbrooke

Jan 2025 - Present, Sherbrooke – Canada

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Robust Temporal Action Localization for Human Activity Understanding:

- Developing richer video representations and leveraging multimodality for temporal action localization.
- Designing a real-time human action recognition system using self-supervised learning (SSL) and Vision Transformers (ViT) to improve model robustness and scalability.
- Addressed ViT training instability through advanced augmentation strategies and semantic-aware masking to prevent representation collapse.
- Implementing zero-shot learning approaches for action classification and downstream generalization.
- Integrating multimodal pretraining with image-text and sensor data to enhance representation learning and cross-modal alignment.

Natural Language Processing:

- Retrieval unstructured data using LangChain, working with different data types, enhancing model adaptability to new data using LightRAG.

ML Researcher / Concordia University Dec 2021 - May 2024, Montreal – Canada

Deep Learning & Digital Signal Processing :

- Implemented and fine-tuned machine learning models for image classification and recognition, achieving Top-rank recognition accuracy in benchmark datasets.
- Developed regularization techniques in cross-entropy and dynamic margin in softmax classifiers for noisy domains, successfully classifying hard samples. Enhanced the Adam optimizer with momentum weighting, improving accuracy for non-convex problems.
- Pioneered inductive learning techniques for transformer models. Executed a bottleneck architecture in both pure Vision Transformer (ViT) and hybrid CNN-ViT models, enhancing model performance.
- Designed and developed generative AI models with LLMs, GPT, ChatGPT, Generative Diffusion, and Transformers, enhancing stability and training progress to produce fine-detail information for image generation.
- Solid background in DSP with applied knowledge in domains such as Stochastic Processes, Matrix Calculus, Speech Recognition, and Graph Convolution.

Natural Language Processing | Self Projects:

- Tailored foundational LLMs with domain-specific data for targeted applications such as speech-to-text, machine translation, sentiment analysis, text generation and developed LLM-based applications with LangChain.
- Deployed "Chatting with Your Data" using serverless architectures in Bedrock for content creation, sentiment analysis, and meeting text summarization.
- Developed a semantic search engine using a pre-trained transformer model, featuring era-specific search options, dynamic real-time queries, and batch processing for improved scalability and efficiency.

Object Detection & Autonomous Vehicle | Self Projects:

- Led the development and deployment of real-time systems for object detection, recognition, and tracking, utilizing advanced deep learning frameworks to enhance accuracy, reliability, and speed estimation.
- Developing Robust Enterprise-Level Machine Learning Models in AWS and React.
- Enhanced the sustainability of autonomous robots by implementing Kalman filters in self-driving cars for sensing and optimal action. Developed and tested various Vehicle Routing Problem (VRP) algorithms to minimize costs and maximize efficiency, assessing their performance using solvers like CBC and OR-Tools.
- Strong statistical expertise and applied experience with graph embedding methods, including DeepWalk, GCN, and GAN.

CONFERENCES / PRESENTATIONS

- 8th IEEE Research Boost 2021 “Give your research industrial edge.”
- 6th , 7th , 8th Graduate Student Research Conference (2022-24)/ Concordia University /Second Award.
- Grant for 9th International Artificial Intelligence Conference Funding /ICOAI (2022). (Presentation)
- STARaCOM (2023) / McGill University.
- 3-MT Concordia University Thesis Competition (2023, & 2024))/ Concordia University.
- The 7th Montreal Photonics Networking Event (2023)/Ecole de Technologie Supérieure.
- AI and Sustainability – Applied AI Institute (2024)/ Concordia University.
- IVADO Digital Futures (2024)/ Université de Montréal.
- CCCI (Mixer Kick-Off Event) (2024)/ Mila Institute.
- Inaugural School of Health Conference (2024)/ Concordia University.
- SALTISE 13th Annual Conference (2024) / Concordia University.
- SEMLA 2024, (Software Engineering for Machine Learning Applications) / Polytechnique Montréal.
- Computer Science Club Seminar 2025, Université de Sherbrooke.
- INTER-Activités (Scientific Day 2025) /Higher School of Technology (ÉTS).
- INTER-Activités (Summer School 2025) /Higher School of Technology (ÉTS).
- SEMLA (Software Engineering for Machine Learning Applications) (2025) / Polytechnique Montréal.
- SEMTL Community Meeting (2025) / Polytechnique Montréal.

Languages

- English: Advanced
- French: Intermediate

EXPERIENCE

AI & IoT Researcher / Islamic Azad University & ITRC 2014 - 2017, Tehran – Iran

- Conducted an in-depth analysis of reinforcement learning algorithms in control tasks, exploiting LSTM for hidden layers improved with the deep Sarsa technique and Deep Convolutional Q-Learning with NAF algorithm, tuning parameters with Optuna. Enhanced performance by improving model stability through implementing Double DQN, Dueling DQN, AB testing, UCB, Thompson sampling, , and policy gradient methods (DDPG, TD3, A2C, A3C).
- Explored a wide range of local and global search operators, putting theory into practice by successfully implementing population-based optimization algorithms, including genetic and particle swarm optimizers.
- An active researcher in AI and IoT projects and directed a comprehensive report on smart city challenges through supporting/consulting companies by introducing IoT/Smart City Marketing.

Computer Engineer/ Kavir Wagon Company - 2011- 2014, Tehran – Iran

- Developed applications by setting up prerequisites to be installed on the host and configuring dependencies. I closely collaborated with operation teams to resolve setting up issues with Docker.
- Worked on FPGA programming using VHDL for time-sensitive projects focused on improving the battery life of portable devices used for humidity detection sensing.

Volunteering

- Municipal Election – Montréal, Québec (2021)
Participated in campaign activities for four candidates.
- Federal Election – Montréal, Québec (2021)
Engaged in campaign activities for two candidates.
- Member of the Université de Sherbrooke Proud to Be Green Network (Apr 2025 - Present).
- Peer reviewer for the 38th Conference on Neural Information Processing Systems (NeurIPS 2024).
- Peer reviewer for the 42nd International Conference on Machine Learning (ICML 2025).
- Peer reviewer for the 38th Conference on Neural Information Processing Systems (NeurIPS 2025).
- CR+ Doctoral Research and Career Day, Université de Sherbrooke – May 2025
- REMDUS 5@11 Charity Event Supporting LEUCAN - July 10, 2025
- Member of Agile Sherbrooke Board of Directors

Certified Course

- Post-Secondary Teaching Course (Summer 2025), Centre CR+, Université de Sherbrooke
“Completed a pedagogical training focused on teaching in higher education. This certification enhanced my ability to make informed instructional decisions and design effective, learner-centered courses aligned with academic objectives.”
- Responsible Conduct of Research (Summer 2025), Centre CR+, Université de Sherbrooke
“Completed a certification focused on ethical principles and best practices in academic research. This training strengthened my ability to identify, assess, and address ethical challenges, comply with research ethics board standards, and integrate responsible conduct into research involving human participants.”