

SyedHamed RahmaniKhezri

Applied Machine Learning Scientist/ Engineer | M.Sc in Computing Science
Vancouver, BC, Canada | +1-7787237574 | rahmani.s.hamed@gmail.com | webpage

Summary

Applied ML Research Engineer with 5+ years of experience in computer vision, generative models, and production ML systems. Track record translating research into scalable deployed products within pipelines processing **187M+** image operations. Experienced across the full ML lifecycle from dataset curation and model training to end-to-end model deployment across diverse image modalities.

Work experience

Machine Learning Research Engineer II

Nov. 2024 - Feb. 2026

Captura (Skylab Technologies before acquisition)

Vancouver, BC

- Led cross-functional development and deployment of a constraint-aware portrait cropping system using **quadratic programming** optimization, integrating it into the production workflow and contributing to a major client acquisition.
- Designed a **CNN regression** model to predict color editing parameters from **100K+** yearbook images, achieving **3.5 mean LAB error** for automated high-volume color correction — deployed via OpenVINO/ONNX and **Triton** with DVC versioning and cross-runtime validation.
- Researched and prototyped a **self-supervised contrastive learning** framework for latent color embeddings, enabling style-conditioned transfer and reducing labeled data requirements by **80%**.
- Cut infrastructure cost by **50%** and increased throughput by **20%** by migrating GPU face landmark model to an optimized **CPU ONNX pipeline** with K-means hallucination detection.

Machine Learning Research Engineer I

Aug. 2022 - Nov. 2024

Skylab Technologies Inc.

Vancouver, BC

- Engineered a face **super-resolution** model using **vector-quantized codebooks and transformers**, trained on **6M+** images with realistic mobile degradation pipelines (iPhone-DSLR experiments) — deployed in a consumer mobile app, increasing user engagement and contributing to company acquisition.
- Architected a multi-stage **GAN** pipeline for portrait **stray-hair removal**, combining global alpha mask prediction with patch-level refinement, trained on **5M+** synthetically generated before/after pairs — eliminating **90%** of manual annotation, enabling model training at scale.
- Designed automated dataset validation using **IoU/Dice** consistency checks and trimap uncertainty metrics, removing **30%** noisy samples and improving training stability and generalization.
- Reduced operational costs by **40%** by designing a lightweight residual-feature glare detection pipeline for early inference-stage filtering on eyeglass regions.

Machine Learning Developer Intern

May. 2021 - Aug. 2021

Kinaxis

Ottawa, ON

- Developed ensemble time-series forecasting models (LightGBM, Optuna, SHAP) for supply chain demand prediction, alongside a Python-based ML test and validation framework for deployment pipelines.

Research Assistant

Sep. 2019 - Jul. 2021

Network and Multimedia Systems Lab, Simon Fraser University

Burnaby, BC

- Proposed the first **unsupervised single-image reflection removal** framework using cross-coupled Perceptual Deep Image Priors with semantic feature embeddings — outperforming 4 supervised baselines (**3.94 MOS**, 800 human evaluations, **37% improvement**) without paired training data. (**IEEE TMM**)

Research Assistant

May. 2018 - May. 2019

AMCS Lab, University of Tehran

Tehran, IR

- Designed a **Deep Reinforcement Learning (DQN)** model for dynamic resource allocation, defining custom state, action, and reward representations to optimize placement cost and admission ratio under compute, bandwidth, and reliability constraints. (**IEEE GLOBECOM**).

Education

Simon Fraser University

Sep 2019 - Dec 2021

M.Sc. - Computing Science (GPA: 4.0/4.4)
Thesis: Unsupervised Single-Image Reflection Removal

University of Tehran

Sep 2014 - Jul 2019

B.Sc. - Electrical Engineering, **Minor** - Computer Engineering

Skills

Programming Languages: Proficient: Python. Intermediate: C/C++

ML & Frameworks: PyTorch, Keras/TensorFlow, OpenCV, NumPy, scikit-learn, Pandas, HuggingFace, vLLM

MLOps & Serving: ONNX, Docker, DVC, Git, CI/CD

Cloud & Data: AWS(S3, Lambda, RDS, EC2), Terraform, PostgreSQL, Amazon Bedrock

Projects

LLM-Powered RAG and Multi-Agent Systems

- Built a **ReAct-based RAG** chatbot using GPT-4 (OpenAI API), **LlamaIndex**, and **Chainlit** with Wikipedia as a knowledge source; evolved the concept to a **multi-agent** system using **CrewAI** orchestration, Amazon **Bedrock** foundation models, and **Aurora PostgreSQL** as a vector store with Bedrock Guardrails for content safety.

Cloud-Native AI Infrastructure and Data Pipelines

- Provisioned a serverless RAG pipeline on **AWS** using **Terraform** (S3, Lambda, API Gateway, Bedrock Knowledge Bases, RDS vector store) with event-driven document ingestion and guardrail-filtered question answering.
- Built real-time streaming and batch ETL pipelines using Apache **Kafka** (Confluent Cloud), Apache Druid on EC2, Grafana, and Apache **Airflow** for end-to-end data ingestion, orchestration, and visualization of streaming data.

Computer Vision and NLP Projects

- Built a high-throughput multimodal annotation pipeline using **Qwen2.5-VL** and **vLLM**, asynchronously generating structured labels for **500K** images for large-scale training data.
- Trained a multi-head multi-label classifier using PyTorch **Lightning**, Hydra, and **DDP** for automated photo culling via image quality, pose, and subject predictions.
- Developed a multi-class topic classifier using **RNN** on 20 Newsgroups, achieving **91.3%** validation accuracy.
- Built a weak-supervision framework for a **multimodal VQA** system (ResNet-18 + GRU), using captioning (InceptionV3 + attention) with GloVe similarity for pseudo-label generation.

Publications

- Unsupervised Single-Image Reflection Removal.** S.H. RahmaniKhezri, S. Kim, M. Hefeeda. *IEEE TMM*, 2022.
- Deep Reinforcement Learning for Dynamic Reliability Aware NFV-Based Service Provisioning.** S.H. RahmaniKhezri et al. *IEEE GLOBECOM*, 2019.

Awards and Honors

Graduate Fellowship, Simon Fraser University Computer Science Department, due to academic excellence. 2020
Fully-funded Admissions, Rice University and UMD (Ph.D., ECE), Simon Fraser University (M.Sc., CS). 2019
Honored Alumni Award, University of Tehran ECE Department. 2017
Iran's National Elites Foundation. Ranked 71st among 250,000 in national entrance examination. 2014