



NARGES VAHDANI

DATA SCIENTIST_AI ENGINEER

Nationality: Canadian | **Work Permit:** L permit (Post-Study Job Search-Swiss Graduate) *

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📁 **GitHub:** <https://github.com/nargesghv>

*May qualify for the precedence rule waiver under [Art. 21 Abs. 3 AuG](#)

SUMMARY

Creative and driven professional blending technology, design, and applied science to tackle real-world challenges. Skilled at hands-on development and strategic problem-solving, with a practical, can-do attitude and a collaborative spirit. Energetic and adaptable, I thrive on learning new skills, overcoming obstacles, and contributing to impactful projects.

WORK EXPERIENCES

Master thesis and Intern , Multidimensional Database – IBM Research – Zurich, Sep 2024 – Feb 2025

- Collaborated on the Agent Bee team for IBM's Geospatial Studio, adding agentic tools that enable automatic prompt refinement, on-the-fly model tuning, and semantic dataset selection via vector-based retrieval.
- Collaborated with the Zurich NL-to-SQL team to fine-tune models on client data; when data quality was insufficient, designed an end-to-end pipeline using IBM Granite 3 and advanced prompt engineering to generate high-quality synthetic GeospatialSQL training data—enabling LLMs to be fine-tuned on domain-specific spatial tasks with minimal real data, and was praised for this innovative solution.
- Created a user-friendly, multimodal natural language-to-SQL interface for IBM's multidimensional geospatial database by fine-tuning large language models (IBM Granite, LLaMa 3.2) with SFT, QLoRA, and RLHF—ensuring accurate, interpretable geospatial query results through targeted benchmark evaluations.

Research Assistant – iHomeLab – Lucerne University – Lucerne, Mar 2023 – Feb 2025

- Addressed farmers' need for real-time technical support: Built a RAG-powered educational chatbot (LLAMA 3.1 & CRAG) using AWS Lambda and S3 to enable on-demand Q&A and feedback in the agriculture domain, resulting in measurable improvements in crop management and production quality.
- Improved weak-signal detection for Ambient Assisted Living: Engineered a framework combining vector similarity search and clustering to enhance noisy AAL sensor data, then trained CNN/RNN time-series models to predict elderly presence in rooms—enabling more reliable monitoring and informing the design of safer, stress-free living environments.

Data Engineer Intern – Basler & Hofmann – Zurich, Apr 2023 – May 2024

- Enhanced B&H Digital Twin Quality: Developed voxel-based CNN models for point cloud segmentation to label each point, enabling higher-fidelity infrastructure visualization and improving data quality for digital twin platform developers.
- Accelerated HR Data Retrieval: Built an agentic Q&A pipeline over HR databases by applying LLMs for automated SQL generation and querying, significantly speeding up data extraction for the HR team.
- Streamlined Revit Workflows with AI: Architected a hybrid PyRevit + LLM pipeline for rule-based model validation and task automation, delivering a 30% workflow speed-up—allowing non-technical staff to interact via Revit and reducing project time while maintaining optimized results.

Director, Data Engineering – PMO Group(Business Analysis) – Toronto, Sep 2018 – Jan 2021

- Built a predictive real estate analytics platform integrating Power BI and SAP, delivering market insights to executives.
- Deployed a real-time app using fine-tuned regression models to forecast housing prices across Toronto neighborhoods.

PROJECTS ([GITHUB : HTTPS://GITHUB.COM/NARGESGHV](https://github.com/nargesghv))

🎤 Accent Classification from Voice

Tech: Wav2Vec2, Common Voice, PyTorch, Hugging Face, TorchAudio, Librosa, Scikit-learn

🔥 Project: Synthetic Data Generation Pipeline for Enterprise AI (NLtoSQL Team IBM Research)

Tech: Large Language Models (LLMs), Prompt Engineering, Advanced Prompt Engineering

🤖 Realtime Multi-Agent Conversational System using LangGraph and MCP

Tech: LangChain, LangGraph, MCP, LLM, Python, Tool Augmentation, Asynchronous Programming, OpenAI, DALL-E, Matplotlib, Prompt Engineering, Agent Design, Server-Sent Events, Conversational AI, Generative AI, Multi-Agent Systems

GraphRAG Legal Contract Intelligence

Tech: LangChain, Neo4j, FastAPI, Cypher, Pydantic

DriftAlert: Real-Time AI-Powered Schema Monitoring System

Tech: GPT-4o, LangChain Agents, PostgreSQL, Kafka, Guardrails, Pydantic, JSON

LangGraph AI Document Classifier

Tech: LangGraph, GPT-4, FastAPI, React, Tailwind, SQLite, Streamlit

Real-Time AI Chatbot Project

Tech: GPT-4, Kafka, MongoDB, FAISS, FastAPI, Sentence Transformers

Real-Time Business Insights Platform

Tech: Python, Kafka, Azure Cognitive Search, Ollama LLM, FastAPI, LLMops

Real Estate Forecasting Platform

Tech: XGBoost, FAISS, FastAPI, Azure Blob, Azure SQL, Power BI

Real-Time Image Classification System

Tech: TensorFlow, CNN, Kafka, FastAPI, Docker, OpenCV

MachiStages of Menopause – Health Education Project

Tech: Gradient Boosting, Linear Regression, Synthetic Data, Feature Importance

EDUCATION

Master of Science in Data Science

HSLU (Lucerne University of Applied Sciences) | Sep 2022 – Feb 2025

Bachelor of Engineering in Electrical Engineering (Automation & Control Systems)

IKIU | Sep 2007– Jan 2011

AWARDS AND CERTIFICATION

Python Programming Certificate (2020)

EDUCBA Python Institute, Toronto, Canada

Certificate in AWS Cloud Architect (2018)

Metro College of Technology, Toronto, Canada

Professional Diploma in Interior/Fashion Design (2012)

George Brown College, Toronto, Canada

SKILLS

- **AI/ML:** GPT-4, LLaMA, Hugging Face, PyTorch, TensorFlow, Scikit-learn, RLHF, QLoRA, Wav2Vec2
- **GenAI & Agents:** LangChain, LangGraph, OpenAI Assistants API, RAG, GraphRAG, Prompt Engineering
- **Computer Vision:** YOLOv8, OpenCV, 3D Reconstruction, SLAM, Image-to-Text, WebXR, Unity3D
- **Data Engineering:** Kafka, Airflow, FastAPI, Docker, Kubernetes, PostgreSQL, MongoDB, DBT
- **MLOps & Deployment:** CI/CD (GitHub Actions), Azure, GCP (Vertex AI, BigQuery), AWS (SageMaker)
- **Analytics & BI:** Power BI, Streamlit, SQL, Experiment Design, A/B Testing, Feature Importance
- **NLP & Search:** Text-to-SQL, Semantic Search, pgvector, Neo4j, Cypher, LangChain Tools
- **Software Dev:** REST APIs, Pydantic, JSON, Jupyter, React (basic integration)
- **Soft Skills:** Technical leadership, agile mindset, cross-functional teamwork, mentoring
- **Languages:** English (fluent)