Mohamed Deraz Nasr

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Education

Georgia Institute of Technology Jan 2026 – May 2027
MSc Computer Science (Machine Learning Track) *Atlanta, Georgia*
Coursework (ongoing): Computer Vision, Deep Learning, Graphical/Generative Modeling, Reinforcement Learning

University of Ottawa | 3.5 GPA Sept 2020 – May 2025
BSc Software Engineering *Ottawa, Canada*
Coursework: Operating Systems, Software Design/Architecture, Database Systems, Data Structures/Algorithms

Experience

Shopify Ottawa, Canada
Machine Learning Engineer Intern *Jan 2025 – Apr 2025*

- Prototyped **PyTorch LLM** converting natural language to **SQL**, deployed fast inference path reducing query time by **80%**.
- Developed production ML pipelines **(Python, SARIMA, MLflow, SQL)** for forecasting, improving accuracy **7%** across **5+** teams.
- Designed & optimized inference pipelines **(Python/Redis/Docker)** for real-time **XGBoost** predictions with **35%** lower latency.
- Presented product to **20+** senior/staff engineers and team **leads** at cross-team review, earning highest performance grade.

University of Ottawa Ottawa, Canada
Research Engineer Intern (Supervised by Prof. Kalonji) *Sept 2024 – Dec 2024*

- Researched distributed & **reinforcement learning** for solar forecasting, enabling adaptive model retraining workflows.
- Engineered data pipelines **(Python/Go)** handling **200K+** daily readings with **99.9%** accuracy using **Redis** acceleration.
- Built fullstack real-time solar forecasting dashboard with **Next.js/GraphQL**, delivering **XGBoost** predictions under **200 ms**.

University of Ottawa Ottawa, Canada
Full Stack Developer Intern *Sept 2023 – Dec 2023*

- Delivered data validation pipelines (**Node.js/React Native**) for **20K+** students, reducing submission errors by **30%**.
- Redesigned **50K+** record **PostgreSQL** pipeline and API queries, lowering high-concurrency latency by **40%**.

March Networks Ottawa, Canada
Systems Engineer Intern *Jan 2023 – Apr 2023*

- Created **C/C++** debugging tool (**Python/Docker**) for **RTSP/WebSocket** on **Linux**, improving system resilience by **25%**.
- Developed **Node.js/PostgreSQL** dashboard to monitor performance across **200+** deployed networked camera systems.

Projects

Affinity Map – *Python, PyTorch, Biopython, NumPy, scikit-learn, UMAP, Matplotlib* Sep 2025 – Nov 2025

- Trained few-shot protein embedding model & built PyTorch/Biopython pipeline with visualization for function similarity analysis.

Race Strategy Simulator – *Go, Python, PyTorch, TypeScript* Aug 2025 – Oct 2025

- Designed multi-threaded **Go** backend running **10K+** race simulations per epoch, improving RL training throughput significantly.
- Developed end-to-end pipeline connecting simulation outputs to agent training, outperforming baseline strategies.

Protein Diffusion – *Python, PyTorch, C++, CUDA, Transformers, OpenFold API, RDKit* October 2025 – Present

- Built diffusion-based protein 3D structure generator with conditioning & RDKit-driven plausibility checks for structure validation.

Extracurriculars

UOBionics – Allonstride Ottawa, Canada | Jan 2024 – Dec 2024

- Engineered embedded **C/C++** firmware (**STM32**/**FreeRTOS**) for exoskeleton motor & biosensor control (**I2C**/**SPI**/**UART**).
- Created **(AWS/Python/WebSockets)** pipelines with **FastAPI/React** dashboard for live anomaly detection on **100K+** signals.

Technical Skills

Programming: Python, Go, TypeScript, SQL, C/C++, JavaScript, Java
AI/ML: PyTorch, Transformers, XGBoost, scikit-learn, MLflow, HuggingFace, Pandas, NumPy, UMAP, RDKit, Langchain
Backend/Systems: GraphQL, FastAPI, Node.js, Next.js, Redis, PostgreSQL, MongoDB, WebSockets
Cloud/Infra: AWS (EC2, Lambda, S3), Docker, Kubernetes, BigQuery, Vertex AI, GitHub Actions