OMAR HAMMAMI

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Experience

Software Engineering Fellow **Feb 2025 – May 2025**
The Recurse Center *New York, NY*
- Completed self-directed programming retreat to expand from ML into systems programming and full-stack dev
- Built applications in Rust, including real-time music visualizer integrating computer vision and audio processing
- Practiced "learning generously" through daily pair programming and code reviews, working at edge of abilities with senior engineers

Software Engineer (Contract) **Mar 2025 – Apr 2025**
The Sentience Company *New York, NY*
- Built voice fingerprinting enabling automatic speaker identification—foundational for personalized insights
- Implemented across full stack in 4-week sprint: database design, SwiftUI onboarding, voice embedding API

Machine Learning Engineer **Aug 2023 – Dec 2023**
NDA Early-Stage Stealth Startup *Washington, DC*
- Led end-to-end ML development as sole engineer, designing and deploying multimodal computer vision system
- Revamped failing ML pipeline through dataset augmentation and new architecture, achieving first usable predictions
- Deployed system using pose detection and CNNs on Google Cloud Platform

Machine Learning Intern **Jul 2023 – Sep 2023**
The New School *New York, NY*
- Developed privacy-preserving LLM assistant using RAG, vector database, and chain-of-thought prompting
- Secured additional funding through demonstrated accuracy and data security

Machine Learning Student Researcher **Sep 2020 – Jan 2023**
C2SMART Center *New York, NY*
- Co-authored 2 peer-reviewed publications on traffic prediction and computer vision applications
- Researched and implemented predictive models using boosted trees for traffic intersection activity estimation
- Built computer vision systems for vehicle tracking and detection using YOLO and Kalman filters
- Managed dataset curation project for NYC traffic cameras, leading annotation team

Education

New York University **New York, NY**
M.S., Computer Science Sep 2022 – May 2024
New York University **New York, NY**
B.S., Computer Science, Minor in Math Sep 2018 – May 2022

Projects

SAM_CAM_BAM: Real-time Video Segmentation Music Visualizer (Rust, ONNX, Computer Vision)
- Developed interactive visualizer combining webcam segmentation (ONNX FastSAM) with real-time audio analysis
- Implemented frequency band processing (bass/mids/highs) for dynamic visual effects synchronized to music
- Built with focus on performance and low-level systems programming in Rust

Betterd Spotify: Neurosymbolic Music Intelligence System (Rust, Axum, Dioxus, Neo4j, OpenRouter)
- Built a full-stack neurosymbolic system in Rust to reclaim user control from biased streaming algorithms
- Implemented LLM feature extraction and Neo4j graph reasoning for deep, user-driven library curation

hambaJubaTuba: Diffusion-Based Music Visualizer (Python, PyTorch)
- Created beat-synchronized animations using Stable Diffusion and advanced DSP (chroma CQT, onset detection)
- Built Gradio interface supporting custom models and ControlNet integration with optimized inference

A Careful Look into Graph Contrastive Learning (Python, PyTorch) - Masters Research
- Validated claims in You et al.(2020), discovering negative sampling drives GCL performance, not data augmentation
- Developed importance-weighted negative sampling achieving 2% improvement on COLLAB dataset

Technical Skills

Languages: Python, Rust, JavaScript/TypeScript, SQL, R, C++, Swift, Go, Java
Machine Learning & AI: PyTorch, TensorFlow, Computer Vision, Transformers, LLMs, RAG, ONNX
Data Science & Analytics: pandas, NumPy, scikit-learn, R, D3.js, Plotly, Tableau, A/B Testing, Spark, Dask
Full-Stack Development: React, Node, Flask, Axum, Dioxus, SwiftUI, PostgreSQL, REST APIs, TailwindCSS, Neo4j
Systems & Infrastructure: Performance Optimization, Real-time Processing, Docker, GCP, AWS, Linux, CI/CD