Immanuel Peter

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EDUCATION

The University of Chicago, Chicago, IL
Bachelor of Science in Computer Science, expected June 2028
Relevant Coursework: Intro to Computer Science, Systems Programming, Mathematical Foundations of Machine Learning, Abstract Linear Algebra, Analysis in Rn I

SKILLS

Software Engineering: Python, TypeScript, React, Node.js, Git, GitHub, Docker, Docker Compose, MySQL, PostgreSQL, Go, REST APIs, Systems Programming
AI/ML Engineering: PyTorch, TensorFlow, FAISS, Transformers, RAG, NLP, Computer Vision, Model Training & Deployment

EXPERIENCE

Quantum Rings, Chicago, IL, *Software Engineer Intern*, June 2025 – August 2025

- Strengthened backend infrastructure by resolving a critical Docker startup failure, refactoring the user schema for improved modularity, and deploying a scalable telemetry aggregation worker using AWS SQS and TypeORM.
- Engineered a full-stack analytics feature by designing and implementing backend endpoints and a frontend admin dashboard to visualize user metrics with dynamic time-interval filtering.
- Drove system-wide improvements by coordinating SQL schema changes and message queue integrations, and integrated a HubSpot contact-sync automation to streamline lead intake.

Cornerstone Business Solutions, Bentonville, AR, *Data Analyst Intern*, June 2022 – August 2022

- Automated product availability monitoring with Python web scrapers to enhance restocking decisions
- Analyzed 100+ products to optimize inventory and boost sales for Walmart third-party sellers

PROJECTS

AutoMoE: MoE Self-Driving Model

- Designing a modular Mixture-of-Experts (MoE) model for autonomous driving, integrating expert subnetworks trained on nuScenes and BDD100K with a learnable gating mechanism
- Leveraging CARLA autopilot data for fine-tuning and alignment with simulated driving environments, enabling improved generalization and control
  Tech Stack: PyTorch, CARLA, Python, Linux, Bash

CARLA Autopilot Images (Open Dataset)

- Released a multi-camera autonomy dataset (68k frames, ~188 GB) with synchronized vehicle state and control for vision-to-control benchmarks; includes dataset card and reproducible collection script
- Collected via a synchronous CARLA pipeline with variable weather, NPC traffic, collision logging, and per-run quality metrics; published stable splits and versioned artifacts
  Tech Stack: Python, CARLA, Hugging Face Datasets, NumPy, tqdm

LocalRAG: Terminal LLM with Infinite Memory

- Developed a command-line interface (CLI) for seamless, ChatGPT-style interactions with large language models
- Integrated a local FAISS vector database for long-term conversational memory, enabling smarter, context-aware responses across sessions
- Supported model switching, chat saving, and configuration via CLI commands.
  Tech Stack: Python, FAISS, Sentence Transformers, OpenAI API, Anthropic API, Click, Rich

PyTorch Semantic Image Search Engine

- Engineered a full-stack semantic image search application leveraging OpenAI CLIP for efficient text-to-image querying
- Built a FastAPI backend with PyTorch to process and serve semantic search results for preloaded image datasets
- Demonstrated advanced skills in machine learning, full-stack development, and REST API design
  Tech Stack: Python, PyTorch, FastAPI, Next.js, Tailwind CSS, Hugging Face Transformers