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, Docker, PostgreSQL, Go, REST APIs
AI/ML Engineering: PyTorch, JAX, FAISS, Transformers, RAG, NLP, Computer Vision, Model Training, Hugging Face

EXPERIENCE

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

- Fixed critical backend reliability issues by repairing Docker startup failures and refactoring the user schema for modularity and stability.
- Built queue-driven background workers (AWS SQS, TypeORM) for telemetry aggregation, execution processing, and HubSpot contact sync, enabling scalable, fault-tolerant data pipelines.
- Developed full-stack admin dashboards (NestJS, Next.js, MUI/Recharts) with time-bucketed metrics, execution trends, and real-time user monitoring.
- Launched public developer profiles with UUID-based certifications, badges, and social sharing to highlight user achievements and strengthen platform community.

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 Datasets (Open Source)

- **CARLA Autopilot Images:** multi-camera dataset (68K frames, ~188 GB) with synchronized ego state + controls for vision-to-control and imitation learning.
- **CARLA Autopilot Multimodal:** extended version (82K frames, ~365 GB) adding semantic segmentation, LiDAR, 2D bounding boxes, and richer environment metadata for sensor fusion and RL research.
- Built reproducible CARLA pipelines with variable weather, traffic NPCs, and collision logging; ensured clean splits and dataset cards for research reuse.
  Tech Stack: Python, CARLA, Hugging Face Datasets, NumPy, Linux

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
  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
  Tech Stack: Python, PyTorch, FastAPI, Next.js, Tailwind CSS, Hugging Face Transformers