John Kim

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EDUCATION

University of Notre Dame — May 2026
Bachelor of Science in Computer Science & Applied and Computational Mathematics and Statistics — Notre Dame, IN
- **GPA**: 3.96
- **Honors**: 1st place IBM Hackathon, Sorin Scholar, iTREDs Scholar, Deans List
- **Coursework**: Neural Networks (grad), ML Embedded Systems (grad), Databases, Operating Systems, Algorithms

EXPERIENCE

Amazon — May 2025—August 2025
AI/ML SDE Intern — Palo Alto, CA
- Built admin and data AI agents in LangGraph with MCP/A2A protocols, long-term memory, and human-in-the-loop.
- Reduced customer service time by 80% with admin agent and translated natural language to SQL with data agent.
- Provisioned zero-downtime agent infrastructure by AWS CDK on ECS/Fargate clusters with auto-scaling/load balancers.
- Synced agent memory with serverless Aurora PostgreSQL database and stored SOPs in a Graph RAG knowledge base.
- Organized the 1st Bay Area AWS intern hackathon for 200 interns, raising $3,000 in sponsorships and enlisted 8 judges.

DM2 Lab — November 2024—Present
Research Assistant — Notre Dame, IN
- Generated evals on multimodal contextual safety with 9,600 dialogue pairs to evaluate open/closed-source models.
- Optimized generation judge metrics from 62% to 92% with GEPA and monitored experiments in mlflow and wandb.

Humana — May 2024—August 2024
Data Analyst Intern — Louisville, KY
- Eliminated 2,500 redundant mobile lines, saving $2.4MM annually from Power Apps and Power BI dashboards insights.
- Updated internal LLM chatbot in C#/ASP.net, receiving 20,000 daily queries, and increasing user productivity by 15%.

Alora Finance Startup — September 2023—May 2024
Lead SWE — Notre Dame, IN
- Launched financial education platform used by 800 students and teachers to introduce financial education in schools.
- Led nine undergrads, taught Git/agile development, coded in React, Django REST API, SQL, tested APIs in Postman.

Lucy Family Institute for Data and Society — September 2022—Present
Research Assistant — Notre Dame, IN
- *Accepted paper* at *IDA 2025* as 1st author on a novel relevance-aware algorithmic recourse for explainability/fairness.
- Researching augmentation for graph nodes on GNNs and robust machine unlearning on LLMs to forget unsafe info.

PROJECTS

DSPy (174 GitHub stars, open-source contributor for RL optimizations, Arbor) — May 2025—Present
- Built NVIDIA-GPU monitoring tools for training, and support for single GPU use for vLLM for reinforcement learning.
- Added CLI/Python module for config management, API startup, example scripts, and JQlang query logging for debug.

Handwritten Math Equation Transcriber — February 2025—May 2025
- Designed bidirectional LSTM encoder-decoder architecture with multi-head attention mechanism for seq2seq learning.
- Pre-processed equations to LaTeX, then corrected with LLM using in-context learning with 92% validation accuracy.

Food Tinder (*1st Place Advanced Databases Final Project*) — February 2025—May 2025
- Architected React Native app with Expo/Redux, Python (FastAPI), Oracle database, AWS EC2 hosting and S3 buckets.
- Coded collaborative filtering recommendation system using PL/SQL procedures, indexes, views and job scheduler.

Trip It! — September 2024—December 2024
- Built entire backend with Flask, PostgreSQL (pgvector for embeddings), Redis/Celery for task scheduling, AWS hosted.
- Generated 10k synthetic trips, automated clustering/vectorizer model updates, designed content-based recommender.

LEADERSHIP AND ACTIVITIES

Theory of Computing Course — August 2024—December 2024
Teaching Assistant — Notre Dame, IN
- Held weekly office hours for 150 students on topics for computational theory on Turing machines to NP-completeness.

TECHNICAL AND LANGUAGE SKILLS

Languages: Python, SQL, JavaScript/TypeScript, C/C++, Java, Bash, HTML, CSS
Frameworks/Libraries: PyTorch, TensorFlow, DSPy, LangGraph, vLLM, TRL, Django, Flask, FastAPI, React, React Native, Redux
Tools: Git, AWS, Docker, Figma, GNU/Linux, LaTeX, Oracle, PostgreSQL, MS SQL Server, Power BI, Power Apps