Rithvik Praveen Kumar (U.S. Citizen)

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Education

Purdue University, College of Science *West Lafayette, IN*
B.S. in Computer Science Honors + Mathematics *Expected May 2028*
Concentrations: Software Engineering & Machine Intelligence *3.74 / 4.00*
Relevant Coursework: Java Programming, C programming, Data Structures & Algorithms, Computer Architecture, Software Engineering, Calculus I & II, Multivariate Calculus, Linear Algebra I & II, Advanced Calculus (Real Analysis I), Statistical Theory

Product & Software Development Experience

The Data Mine @ Purdue – Software Developer, Corporate Partners (DELMAR Software) *West Lafayette, IN | Aug 2026 - Present*

- Developing FieldWatch 2.0, rebuilding the DriftWatch specialty-crop registry admin experience into a full operations console for producers, beekeepers, and pesticide applicators across multiple states.
- Building admin workflows, report generation, bulk export, and user administration on a Python and PostgreSQL backend with a Vue front end, working against the platform's existing production schema.
- Designing API access control and service architecture via spec-driven development with Claude Code: writing API contract, architecture, and schema-change specs for review, then implementing them in Claude Code as the platform moves to microservice architecture.
- Working directly with DELMAR product owners and engineers on a milestone cadence, with demos, prototypes, and code reviewed by the partner engineering team.

Technologies Utilized: Python, PostgreSQL, Vue, JavaScript, REST APIs, Microservices, Spec-Driven Development, Claude Code, Git, Agile

Hack The Future @ Purdue - Software Developer *West Lafayette, IN | Aug 2025 - May 2026*

- Shipped a full-stack RAG-based learning platform now serving 500+ underserved learners studying personal finance for a non-profit.
- Built the full retrieval pipeline, chunked and embedded lesson content into a vector database, then grounded LLM responses against retrieved context to eliminate hallucinated financial guidance.
- Ran inference through a low-cost inference API endpoint to meet the non-profit's cost and data-privacy constraints, adapting model selection to prioritize speed and accuracy.
- Implemented automated generation of quizzes, assignments, and lesson content; built the core React frontend and Express/MongoDB backend for lesson delivery.
- Drove spec-driven development with Claude Code: turned stakeholder requirements into written specs, then built to spec with Claude Code.

Technologies Utilized: React, Node.js, Express, MongoDB, Ollama, Vercel, Cloudflare, Spec-Driven Development, Claude Code

Research Experience

Undergraduate Researcher, Vertically Integrated Projects (VIP) – Autonomous Motorsports Purdue (AMP) *West Lafayette, IN | Aug 2026 - Present*

- Selected for a faculty-advised, credit-bearing research team of 30+ students building the full autonomy stack, perception, localization, planning, controls, and simulation for Purdue's driverless racing platforms.
- Working within the software/AI track to apply machine learning and computer vision methods to on-vehicle autonomy problems, developing in Python and C++ on a ROS 2 codebase with LiDAR, camera, and GNSS/IMU sensor data.

Technologies Utilized: Python, C++, ROS 2, Machine Learning, Computer Vision, Sensor Fusion (LiDAR, Camera, GNSS/IMU)

Snowball Lab, Purdue University – Undergraduate Researcher (TinyML) *West Lafayette, IN | May 2026 - Aug 2026*

- Investigated novel low-power system designs, including whether piezoelectric microphones can serve simultaneously as sensing elements and energy sources for microcontrollers running on-device models.
- Trained, quantized, and deployed lightweight models to edge inference hardware via Edge Impulse, analyzing tradeoffs among model accuracy, memory footprint, and energy consumption.

Technologies Utilized: Edge Impulse, Embedded ML, Microcontrollers, Python, C/C++

Projects

rithvik.ai - RAG Powered Personal Knowledge Platform *2025 - Present*

- Designed, deployed, and actively maintain a full-stack site with a retrieval-augmented generation (RAG) layer over my own projects and writing, letting visitors query an AI chatbot directly about me and receive grounded answers.
- Solved production retrieval problems end to end via spec-driven development, writing specs before code: chunking heterogeneous content for accurate passage retrieval, keeping the index current as new work ships, and limiting answers to retrieved context.

Technologies Utilized: Next.js, TypeScript, Supabase, LangChain, Vector Databases, Vercel, Spec-Driven Development

Professional Experience

Code Ninjas – Code Sensei, promoted to Investor Relations Chair *Northborough, MA | May 2023 - Aug 2025*

- Taught programming to 40+ students aged 5 - 12 across JavaScript, C#, and Microsoft MakeCode, designing personalized skill paths and organizing hackathons.
- Promoted to Investor Relations Chair; analyzed company financial performance and delivered quarterly findings to staff and stakeholders.

Skills

- **Languages:** Python, Java, C, C++, JavaScript/TypeScript, SQL, Go, Rust
- **Frameworks & Libraries:** React, Vue, Node.js, Express, Next.js, Flask, LangChain, LangGraph, TensorFlow, Keras, scikit-learn, Pandas
- **Databases & Infrastructure:** PostgreSQL, MongoDB, Supabase, Vector Databases, Git, AWS (EC2, Rekognition), Vercel, Cloudflare
- **Concepts:** REST API Design, Microservice Architecture, RAG / LLM Application Development, Embedded ML, Spec-Driven Development, Agile & Code Review