Jeffrey Perdue

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EDUCATION

Northern Kentucky University — Highland Heights, KY
Bachelor of Science in Applied Software Engineering, Minor in Computer Science, GPA: 3.9 — *May 2026*

SKILLS

Languages: Java, Python, TypeScript, JavaScript, SQL, Dart, Embedded C/C++
Backend & Application: Spring Boot, Node.js, Express.js, React, REST APIs, MongoDB, Firebase
Cloud & Data: Azure, Azure Synapse Analytics, Databricks
Embedded Systems: ESP32, Arduino IDE, Bluetooth Low Energy (BLE), I^2C
Developer Tooling: Git, GitHub, DBeaver, Jira
AI-Assisted Engineering: ChatGPT, Claude, GitHub Copilot, Cursor

EXPERIENCE

Software Engineering Intern — August 2025 – April 2026
Kroger Technology – End-to-End Fresh — *Blue Ash, OH*
- Contributing to backend services, front-end tools, and enterprise data platforms supporting production-adjacent systems using Spring Boot, React, SQL, Azure Synapse, and Databricks
- Engineered a production-grade Spring Boot scheduler to monitor device telemetry gaps, query SQL Server for stale records, and dispatch OAuth2-authenticated Feign email alerts with structured summaries, error handling, and testable service design
- Designed production-grade, version-aware SQL reconciliation logic in SQL Server using CTEs, window functions, and anti-join semantics to manage incremental purchase order loads, enforce soft-deactivation, and eliminate silent pipeline drift
- Participating in Agile and Kanban workflows, contributing to sprint planning and backlog refinement while translating loosely defined business requests into technically precise implementation tasks
- Designing and implementing a centralized mapping internal application as technical owner to standardize temperature zone codes across distribution centers, enabling consistent reporting and controlled business updates to previously unmapped codes

Front End Supervisor — June 2020 – August 2025
Costco Wholesale — *Columbus, OH; Florence, KY*
- Led and coordinated 60+ employees in high-volume retail operations, designing staffing and training structures to maintain performance consistency under fluctuating demand
- Partnered with management to analyze operational data, diagnose workflow bottlenecks, and implement process adjustments for a department generating over $180M in annual revenue

PROJECTS

Petfolio — Cross-Platform Pet Care App — Flutter, Dart, Firebase
- Designed a cross-platform system enabling coordinated pet care management across multiple caregivers, addressing synchronization and role-based access constraints
- Modeled Firestore schemas and security rules to enforce structured ownership and prevent unauthorized data mutation
- Implemented CRUD workflows and media handling while applying repository and Riverpod state management patterns to ensure testability and architectural clarity
- Integrated timezone-aware local notifications to prevent scheduling drift and ensure consistent reminder behavior

StressSpec — Requirements Risk Analysis Platform — Python, FastAPI, Jinja2, CLI, pytest
- Engineered a full-stack requirements risk analysis platform to detect structural ambiguity, scope gaps, and compliance risks before development begins
- Designed a modular rule-based detection engine supporting 8 risk categories with extensible severity scoring and prioritization logic
- Built a FastAPI-powered web application with file upload handling, interactive analysis views, executive summaries, and downloadable HTML/CSV/JSON reports

- Implemented a combined risk scoring algorithm to rank and surface the Top 5 riskiest requirements for stakeholder prioritization
- Maintained dual interfaces (REST API + CLI) backed by a unified analysis pipeline; validated reliability through comprehensive unit and integration tests using pytest

StillCold — BLE-Based Embedded Temperature Monitoring   ESP32-C6, Arduino Nano, BLE, I^{2}C
- Architected a modular embedded system separating sensing (HTU21D over I^{2}C) from wireless communication (custom BLE service) to isolate hardware acquisition from data exposure
- Implemented periodic sensor acquisition and BLE characteristic updates in embedded C/C++ while validating end-to-end data flow via serial diagnostics and BLE scanning tools
- Designed system to operate independently of Wi-Fi or cloud infrastructure, prioritizing low-overhead, deterministic local access

NomNom Safe — Allergen-Aware Menu System   Firebase, React, Express, Node.js
- Collaborated on the design of a structured menu system treating allergen signaling as safety-critical information rather than free-text description
- Refactored MVP architecture to isolate non-core features and improve long-term maintainability
- Modeled explicit allergen attributes and enforced role-based access controls to preserve data integrity and controlled ownership
- Aligned requirements documentation and architectural decisions with IEEE and ISO-inspired standards for traceability and structured reasoning

RESEARCH

Preserving Requirements-Driven Development in the Age of AI   Undergraduate Research
- Designed and executed empirical comparison of requirements-driven versus prompt-only LLM development workflows
- Applied ISO/IEC 25010 quality attributes and IEEE 830 / ISO/IEC/IEEE 29148 standards to evaluate structural integrity, maintainability, and traceability of AI-generated artifacts
- Conducted cross-model architectural comparisons across multiple LLM systems to assess consistency and long-term maintainability risk
- Featured Presenter at ISCAP Conference 2025

AI-Safe Ontology Engineering for Structured Allergen Reasoning   Undergraduate Research
- Designed layered ontology framework to constrain LLM reasoning under uncertainty in safety-critical domains
- Developed formal exposure-state model requiring positive structural evidence for safety inference, reducing unjustified assumptions
- Architected abstraction pipeline (natural language $\rightarrow$ structured representation $\rightarrow$ RDF) to support collaborative ontology construction
- Conducting experimental evaluation measuring reduction in overconfident safety claims through ontology grounding

FELLOWSHIPS & LEADERSHIP

KCV Innovation Fellowship   Spring 2026
Kentucky Commercialization Ventures

- Selected for cross-functional cohort focused on technology commercialization using the Time-to-Market framework
- Developing Market Attack Plans, conducting structured customer interviews, and assessing technology readiness levels
- Rotating as team lead across research phases, coordinating deliverables and pitch execution
- Designing commercialization strategies including IP positioning, revenue architecture, and ecosystem mapping