

PIYUSH DUA

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EDUCATION

Purdue University | B.S. Artificial Intelligence, Minor in Finance

Aug 2025 - May 2029

College of Science · West Lafayette, IN

Relevant Coursework: CS 176 (Data Engineering in Python), CS 182 (Foundations of Computer Science), MA 161/166 (Calculus I-II). Fall 2026: CS 243 (Artificial Intelligence Basics), CS 240 (Programming in C), MA 261 (Multivariate Calculus).

SKILLS

Languages: Python, Java, C, TypeScript, JavaScript, HTML/CSS, SQL

ML / AI: PyTorch, scikit-learn, LangChain, LangGraph, RAG, MCP, OpenCV

Backend: FastAPI, REST APIs, Next.js, React, SQLite, Google Cloud (BigQuery), Neo4j

Tools: Git, GitHub, Docker, Streamlit, Bash

EXPERIENCE

Purdue Corporate Relations | Software Engineering Intern

Apr 2026 - Jun 2026

West Lafayette, IN

- Sponsorship information arrived as scattered PDFs and emails. Built a full-stack web app (Next.js, React, TypeScript, SQLite) so 17+ engineering departments submit through one online form.
- Built 16 REST API endpoints in TypeScript with input validation, hashed passwords, and per-endpoint rate limiting, so sponsorship data stayed protected as more departments came on board.
- Staff spent 45 minutes processing each submission by hand. Built a LangGraph layer that parses submissions into per-company knowledge bases and syncs to Excel and Outlook, cutting it to 5 minutes.

Handshake AI

Dec 2025 - Feb 2026

AI Model Evaluation & Benchmarking (Contract)

Remote

- Models were failing on real charts and diagrams. Wrote structured test cases over real visual data and scored model outputs against them, feeding the results into the training pipeline.
- Ranked outputs from multiple models on identical tasks, giving the team a consistent standard for which responses were actually correct rather than just fluent.

UnStudio.ai

May 2024 - Jun 2024

Data Science Intern

Remote

- Built and shipped image-editing filters in Python with OpenCV and scikit-learn as a live feature of the company's AI image editing app, with data pipelines running on BigQuery.

DOT glasses

May 2023 - Jun 2023

Data Analyst Intern

Remote

- Leadership had no clear view of growth. Built a Python analytics app with pandas, Streamlit, and lightweight ML models so stakeholders could explore the numbers and decide where to expand.

PROJECTS

knitbrain | Memory Layer for AI Coding Agents

TypeScript, Node.js, MCP · npm: knitbrain · github.com/PDgit12/knitbrain

- Fixed model amnesia in AI coding agents: built a local memory layer using 37 MCP tools for storage and retrieval so agents keep project context across sessions instead of re-reading the whole codebase each time.
- Engineered reversible, byte-exact compression of repeated tool output, cutting token usage by roughly 46% across 3M real tool-result tokens; published as open source on npm.

harnage | AI Agent Generator

TypeScript, Bun, MCP · github.com/PDgit12/harnage

- Local models can do real agent work but can't act alone. Built a generator that turns one line of description into a complete agent with tools, permissions, and memory, running on your own machine instead of a paid service.
- Small local models break on prompts large cloud models handle fine. Detects the model and hardware available, then adjusts execution strategy to match, so the same agent runs on either.

ZenithDB | Vector Search Engine Written in C

C, Python, SIMD · github.com/PDgit12/zenithdb

- General-purpose vector libraries leave real hardware performance unused. Wrote a search engine from scratch in C with hand-written SIMD instructions to compare vectors several at a time.
- Benchmarked at 4.7x faster than a standard C loop, 7.1 million operations per second, with a Python interface via ctypes so it drops into normal ML work.

Self-Healing Vision Model | Production Drift Detection

Python, PyTorch, FastAPI · pdua12llm-self-healing-web.hf.space

- Vision models lose accuracy silently as real data drifts from training data. Built a detector comparing a live ResNet-50 against a frozen ResNet-152 teacher using KL divergence, catching drops with no new labels.
- Retraining a full model on every drift is too slow and expensive to repeat. Traces the drop to the single LoRA adapter responsible and retrains only that one, holding accuracy through 1,000+ steps of drift.

LEADERSHIP

Mentor | LaunchPad Purdue

Sep 2026 - Dec 2026

- Mentoring a freshman CS student 1-on-1 through Purdue's peer-mentorship club, guiding them from idea to a shipped first project.