

ABHAY SINGH THAKUR

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EDUCATION

Rutgers University

Master of Science in Computer Science

Jan 2024 – May 2026

New Brunswick, NJ

Purdue University

Bachelor of Science in Computer Science and Data Science (Dean's List and Semester Honors)

Aug 2019 – Aug 2023

West Lafayette, IN

Concentration: Software Engineering, Artificial Intelligence and Machine Learning

Relevant Coursework: Data Structures, Object Oriented Programming, Software Engineering, Databases, Distributed Systems, Machine Learning

EXPERIENCE

Graduate Research Assistant | Rutgers University – New Brunswick, NJ

Jun 2025 – Aug 2025

- Engineered a **high-throughput data processing pipeline** for 3D object detection using LIDAR and camera sensor data, improving localization accuracy by 25% over baseline methods
- Developed backend modules to **auto-generate 3D bounding box metadata** from raw sensor inputs, reducing manual annotation time by an estimated 40% and enabling downstream system consumption
- Implemented **geometric transformation services with 98% reprojection accuracy**, mapping sensor data to real-world coordinates using configurable camera intrinsics and extrinsics

Software Developer Intern | Pacific Northwest National Lab (US DOE) – Richland, WA

Jun 2022 – Oct 2022

- Automated resource provisioning by writing **Terraform** and **Ansible** infrastructure-as-code scripts, cutting deployment time by **3x** and **saving 130+ hours** annually across research teams
- Deployed testbed environments on secure on-premise infrastructure to **simulate and monitor system behavior under threat scenarios**, contributing to observability and failure-surfacing practices
- Reduced network infrastructure storage costs by **20%** through **IaC tooling** and disciplined configuration management across **containerized environments**
- Built **Python-based automation services** to analyze deployment requirements and orchestrate infrastructure provisioning through **CI/CD pipelines**

Software Engineer | Purdue University – West Lafayette, IN

Aug 2022 – Jul 2023

- Developed and maintained **Circuit**, a **Java-based backend service integrated with Brightspace LMS** via **RESTful APIs**, enabling anonymous peer review for **10,000+ students** across the university
- Designed and implemented **API contracts and integration patterns** connecting Circuit to LMS endpoints, ensuring reliable data exchange and handling edge cases for concurrent submissions
- Wrote **automated unit tests using JUnit**, improving code coverage and catching regressions early across multiple release cycles
- Built and supported **Variate**, a **STEM assessment platform** with a **relational database backend (PostgreSQL)**, allowing instructors to create randomized problems, **improving assessment integrity by 15%**

PROJECTS

PharmaGuard | Python, HuggingFace Transformers

Feb 2025 – May 2025

- Architected a **backend retrieval service** combining a distilled language model with **Retrieval-Augmented Generation (RAG)** to detect and explain medication interactions from a custom-built drug database
- Designed a low-latency search layer to query **over 1M+ drug interaction entries**, delivering real-time, context-aware responses via a **RESTful API** with structured JSON payloads

Apex Analytics | Python, SQL, Flask, Dash

Aug 2024 – Oct 2024

- Processed over **2GB of telemetry data** from external APIs using **Python (Pandas)**, building a backend data ingestion pipeline to normalize, transform, and store structured event data
- Designed an **interactive dashboard** using **Plotly and Dash**, serving real-time visualizations including heatmaps and performance comparisons across event conditions
- Built a **Python (Flask) REST API backend** backed by **PostgreSQL** for telemetry storage and retrieval, with structured endpoints for querying event-level and aggregate performance data

TECHNICAL SKILLS

Languages: Java, Python, SQL, Javascript, Typescript, C/C++, HTML/CSS, Shell (Bash)

Frameworks and Libraries: Spring Boot, REST APIs, JUnit, Mockito, React, Next.js, Django, NodeJS, OpenAPI/Swagger

Infrastructure and Data: PostgreSQL, MySQL, MongoDB, Docker, Kubernetes, AWS, GCP, Terraform, GitHub Actions, Jenkins, Datadog

ACHIEVEMENTS

Placed top 10 among 250+ teams at BoilerMake VIII for developing a gamified carbon footprint tracker

Jan 2021

Won 1st place at Purdue Hackers' Hackathon for an Android app to locate lost bikes, handling 50k+ queries

Aug 2020