ABHAY SINGH THAKUR

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EDUCATION

Rutgers University **Jan 2024 – May 2026**
Master of Science in Computer Science *New Brunswick, NJ*

Purdue University **Aug 2019 – Aug 2023**
Bachelor of Science in Computer Science and Data Science ***(Dean's List and Semester Honors)*** *West Lafayette, IN*
Concentration: Artificial Intelligence and Machine Learning
Relevant Coursework: Data Structures, Object Oriented Programming, Machine Learning, Data Mining, Databases, Cryptography

EXPERIENCE

Software Developer Intern | *Pacific Northwest National Lab (US DOE)* – Richland, WA **Jun 2022 – Oct 2022**
- Streamlined resource provisioning by writing **Terraform** and **Ansible** scripts, cutting deployment time by **3x** and **saving 130+ hours** annually for sandbox environments used by various scientific research teams across PNNL
- Deployed and documented testbeds on highly secured on-premise intranet to **simulate cyber threat scenarios**
- Cut network infrastructure storage costs with **infrastructure-as-code** tools, meeting detailed requirements and **reducing costs by 20%**
- Built **Python algorithms** to analyze requirements and automate infrastructure deployment through **IaaS tools**

Software Engineer | *Purdue University* – West Lafayette, IN **Aug 2022 – Jul 2023**
- Developed and maintained **Circuit**, a peer review tool **integrated with Brightspace LMS**, to facilitate online, anonymous peer review, improving student engagement
- Enhanced Brightspace integration using **Java, JavaScript**, and **REST APIs**, enabling access for **10,000+ students**
- Worked with the Innovative Learning team on UI/UX improvements, **increasing user satisfaction by 25%**
- Built and supported **Variate**, a **STEM assessment platform**, allowing instructors to create randomized problems, **improving assessment integrity by 15%**

PROJECTS

PharmaGuard | *Python, HuggingFace Transformers* **Feb 2025 – Present**
- Built a **distilled language model** combined with **Retrieval-Augmented Generation (RAG)** to detect and explain medication interactions from custom-built drug databases
- Designed a lightweight retrieval system to efficiently search **over 1M+ drug interaction entries**, enabling real-time, context-aware medication guidance

Sports Betting Arbitrage | *React, BeautifulSoup, Selenium, PostgreSQL* **Sept 2024 – Dec 2024**
- Develop a sports betting **arbitrage bot** that scrapes odds from **10+ platforms**, analyzes real-time odds differences, and identifies arbitrage opportunities, with **potential profits of 1-5%** per bet
- Process **1,000+ odds entries daily**, automating odds tracking and arbitrage detection, and perform automated betting
- Utilize **Python (BeautifulSoup, Selenium)** for web scraping, NumPy and Pandas for data analysis, and PostgreSQL for data storage; beta features include ML models for odds prediction and human-like automation

Apex Analytics | *Python, SQL, Flask, Dash* **Aug 2024 – Oct 2024**
- Analyzed over **2GB of F1 telemetry data** (throttle, brake, speed) from the FastF1 API and Ergast API using **Python (Pandas)** to compare driver performance and identify key insights like tire degradation and optimal pit stop windows
- Designed an **interactive UI** using **Plotly and Dash**, featuring heatmaps over track layouts to visualize driver stats and performance across different sectors and race conditions
- Employed a **Python (Flask) backend** for data processing and **SQL (PostgreSQL)** for telemetry storage, with beta features including ML models for tire degradation prediction and automated UI for track performance mapping

Purdue Circle | *React, Typescript, GraphQL, next.js, TailwindCSS* **Jan 2022 – May 2022**
- Created a **social media and networking app** for Purdue students as part of an Agile team
- Constructed a pipeline to feed user queries processed by **next.js** into a headless **GraphQL CMS** to minimize response payload size by 60% and served them using **TailwindCSS** on multiple platforms
- Modeled a **popularity engine with 70%+ accuracy** and employed features such as user posts, timelines, direct messaging, and reactions to ensure content is socially curated and promoted exclusively by users

TECHNICAL SKILLS

Languages: Python, Java, Javascript, Typescript, C/C++, HTML/CSS, R, SQL, Assembly (x86, ARM), Shell (Bash)
Frameworks and Libraries: React, Angular, Next.js, Django, NodeJS, Tailwind CSS, AWS, GCP, Azure, GraphQL
Other Skills: PyTorch, Tensorflow, Docker, Kubernetes, PostgreSQL, MySQL, MongoDB, Tableau, Terraform, Ansible

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**