

# Arjun Aggarwal

+1 (571) 286-1141 | [arjunaggarwal173@gmail.com](mailto:arjunaggarwal173@gmail.com) | [linkedin.com/in/arjunaggarwal1/](https://www.linkedin.com/in/arjunaggarwal1/) | [github.com/arjunaggarwal03](https://github.com/arjunaggarwal03)

## Education

### University of Maryland

Expected: May 2025

B.S. Computer Science (Honors) & Applied Mathematics | GPA: 3.8

College Park, MD

- **Honors:** Dean's List (all semesters), CS Departmental Honors Program, OMSE Academic Excellence Award (Spring 2022)
- **Relevant Courses:** Algorithms I & II, Data Structures I & II, Discrete Structures, Parallel Computing\*, Database Design\*, Intro to Compilers, Intro to ML, Computer Systems, Computational Methods (\* are current)

## Experience

### Amazon Web Services

May 2024 – Current

Software Development Engineer Intern

Seattle, WA

- Designing a system to collect settlement/invoice events dropped in transit between services in a sub-ledger reporting system.
- Adding alert mechanisms, ensuring **100%** accuracy in event reporting and eliminating multi-hour manual reconciliation time.
- Persisting event statuses to a **DynamoDB** via **AWS SNS** notifications from each service, ingested by an **AWS SQS** for processing.
- Writing a **JavaScript**-based **AWS Lambda** function scheduled via **EventBridge** to aggregate dropped records in the DynamoDB.
- Adjusting SNS, SQS, and DynamoDB configurations using **AWS CDK** and **AWS CloudFormation** stacks.

### Bank of America

June 2023 – August 2023

Software Engineering Intern

Jersey City, NJ

- Completed 3 projects as part of a POC aiming to transition BofA batch risk testing to stream processing using **Apache Kafka**.
- Automated risk data testing with **Python** and **SQL**, replacing an older Alteryx workflow and reducing run time by roughly **85%**.
- Integrated Bitbucket API with workflow tools, reducing manual **30+ minute** data check-in time to **seconds** for **750+ analysts**.
- Designed a test info microservice using **Java** and **Spring Boot**, containerized with **Docker**, replacing inefficient legacy scripts.

### Capital One

January 2023 – April 2023

Machine Learning Engineering Intern

College Park, MD

- Applied **Spark**'s optimized distributed querying to the Card transaction graph (**900M edges**), enabling faster node info retrieval.
- Utilized Spark GraphFrames and **motif queries (DSL)** for filtered node searches, leading to median **6x faster** graph querying.
- Conducted **80 cloud-based trials** with varying RAM/storage metrics to validate results; presented metrics to stakeholders.

## Projects

**Hermes** | Backend: Python, FastAPI, MongoDB, BERT, Pinecone, AWS EC2 | Frontend: TypeScript, ReactJS

- Designed a CLI tool allowing developers to message code snippets and communicate via the terminal, expediting development.
- Implemented user messaging via **FastAPI WebSockets** with **MongoDB** to store chat data; deployed API to **AWS EC2** instance.
- Stored **BERT embeddings** of messages in a **Pinecone vector database**, providing users with semantic search for chat logs.
- Built an Admin page for various CRUD operations and an onboarding flow with payment options implemented via **Stripe API**.
- Utilized **\$1K** award in credits from AWS Activate to host API and website built using **React** and **TypeScript**.

**Unix-like Command Line Shell in C** | C, Makefile

- Developed a Unix-like command line shell in **C** supporting boolean operations, pipes, and file redirection.
- Implemented CLI tokenization, constructing a tree data structure for efficient parsing and execution of commands.
- Optimized the build process using a comprehensive **Makefile**, establishing clear dependency rules to expedite compilation.

**YOLOv3-based Vehicle Parking Pass Detector** | Backend: Python, Flask, YOLOv3, Google OCR | Frontend: HTML/CSS, JavaScript

- Achieved **96% accuracy** in detecting vehicle parking passes with custom-labeled training data via **YOLO** real-time detection.
- Integrated **Google Cloud AI** optical character recognition to detect pass identification numbers, automating record-keeping.
- Designed a real-time visualization for school administration, hosting the model in a **Flask** server and an **HTML/CSS** front-end.

## Skills

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

**Other:** Git, Django, Flask, FastAPI, Linux/Unix, Apache Spark, MongoDB, Pinecone