

# HARSHIT JAIN

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## EDUCATION

The Pennsylvania State University, University Park PA

Expected Graduation: Dec 2024

Bachelor of Science in Computer Science

**GPA:** 3.7/4.0 | Dean's List (5/5) | Technical Coach @ [CodePath](#) | AlgoPSU Captain @ [ACM](#) | Resident Assistant

**Relevant Coursework:** Data Structures and Algorithms, Math of Machine Learning, Operating Systems Design, Systems Programming, [Supervised Machine Learning](#), [Advanced Learning Algorithms](#) (Deep Learning), [Generative AI with LLMs](#), Theory of Computation, CodePath: (Intermediate+Advanced) Software Engineering, Database Management Systems

## TECHNICAL SKILLS

**Programming Languages:** Python, C/C++, JavaScript, Java, HTML/CSS, MATLAB, Verilog, Assembly (64/32-bit x86)

**Frameworks & Tools:** TensorFlow/Keras, Scikit-Learn, Numpy, Node.js, React.js, Next.js, RESTful APIs,  $\text{\LaTeX}$ , Git

**Softwares:** [AWS](#), GCP, LLMs, MS SQL Server/MySQL/PostgreSQL, Linux/UNIX, SonarQube, Postman, Bitbucket, JIRA

## WORK EXPERIENCE

**Software Engineer Intern**

May 2024 - Present

Hughes Network Systems, LLC (Aeronautical Team)

Germantown, MD

- Automated end-to-end data ingestion pipeline (from AWS S3 to BigQuery) using Cloud Functions (Python) enabling Datatype/Recency/Reliability validation systems, resulting in a 95% reduction in manual intervention
- Developed Python scripts and BigQuery SQL views for Delta Airlines' in-flight connectivity KPI calculations, processing 61k+ flights' data with reducing time complexity to  $O(1)$ , and achieving sub-10-second processing times
- Created intricate billing system Python scripts for processing and invoicing data for over 720k flights annually
- Utilized: Python, Google Cloud Platform (GCP: Cloud Functions / Cloud Run, BigQuery, Pub/Sub), SQL, Agile/Scrum

**Machine Learning Engineer Intern**

Jan 2024 - May 2024

Materials Research Institute (2DCC-MIP Team), Penn State University

University Park, PA

- Leveraged 3 SOTA LLMs (GPT-4, Jurassic2, and Llama2) for chatbot-integrated answer retrieval using the RAG Model
- Architected a Next.js app with end-to-end AWS integration, optimizing RESTful APIs for scalability and deployment
- Automated Python-based AWS Lambdas for video processing and transcription, handling 50% user upload surge
- Implemented AWS Rekognition for image analysis, improving content tagging accuracy and streamlining data processing
- Utilized: Python, Amazon Web Services (AWS), Next.js, LLMs, Deep Learning Models

**Software Engineer Co-op**

May 2023 - Dec 2023

VIAMI Solutions Inc.

Germantown, MD

- Collaborated with the 6-person R&D team to architect and implement a Python-based automated test suite on Linux systems for PNT instruments, ensuring exhaustive test coverage and strict compliance with the SCPI protocol
- Debugged PNT unit source code in C/C++, leading to a 55% reduction in bugs and a 30% increase in code coverage
- Executed 35+ long-term tests on core devices using SCPI commands, ensuring adherence to release-level quality standards
- Utilized: Python, C/C++, SCPI Protocol, Bitbucket, Confluence, SonarQube, Git, Agile, JIRA

**Software Engineer Intern**

May 2022 - May 2023

Materials Research Institute (2DCC-MIP Team), Penn State University

University Park, PA

- Engineered a React.js app, designing 50+ user-facing features across 20+ REACT components (utilized Jest testing)
- Integrated an MS SQL Server relational database to manage data from 500+ instruments across 18+ tables
- Automated Python scripts for data retrieval, manipulation, and integration with robust error handling and efficient filtering
- Research: Developed a Python library for the [Raman Fitting model](#), enabling deconvolution of Raman spectra. The library facilitated interactive preprocessing, effective fitting, and data export, reducing analysis time by 40% (tested)
- Utilized: Python, JavaScript, React.js, Node.js, MS SQL Server, RESTful APIs, Git, HTML/CSS, JIRA

## PROJECTS

**Dynamic Memory Allocator** [C/C++]

Jan 2024 - Feb 2024

- Designed custom malloc, free, realloc; segregated free lists and footer optimization to improve memory management
- Achieved a utilization score of 69% and benchmark throughput at 100% across diverse computing environments

**mdadm Linear Device** [C/C++, Linux]

Feb 2023 - May 2023

- Configured 16 disks of size 64 KB as a 1MB linear device, providing users with a unified address space for data access
- Implemented mount/unmount operations to the linear device, mitigating potential data loss and system crashes
- Designed the read/write functions to set up in the linear device, providing users with comprehensive data access capabilities
- Engineered data caching solution to enhance system latency reduced I/O wait time by 60%