Aditya Singh

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EDUCATION

Virginia Tech   VA
Bachelor of Science in Computer Science, GPA: 3.83/4.0 (In-Major: 3.94/4.0)   *Aug. 2022 – May 2025*

UWC Mahindra   India
IB Diploma Program, SAT: 1560   *Aug. 2020 – May 2022*

EXPERIENCE

Undergraduate Researcher - Machine Learning   Oct 2024 - Present
Virginia Tech   *VA*
- Applying ML to Surface Enhanced Raman Spectroscopy for pH identification of Aerosol Particles.
- Developing classification models using wavelength parameters to determine pH levels.
- Collaborating with interdisciplinary team to integrate ML solutions with spectroscopic data analysis.

Computer Science Teaching Assistant   Aug 2024 - Dec 2024
Virginia Tech   *VA*
- UTA for senior-level Comparative Languages course, covering languages like C++, Rust, Haskell, and Prolog.
- Assist professor in guiding 100+ students through complex programming paradigms and language constructs.
- Selected based on academic excellence and comprehensive understanding of diverse programming languages.

Machine Learning Intern   Jun 2024 - Aug 2024
TCG Digital   *Remote*
- Developed a reinforcement learning model for Irregular Operations (IrOps) optimization in the airline industry.
- Progressively enhanced simulation complexity to align with real-world scenarios, gaining comprehensive understanding of AI applications in airline operations.
- Collaborated with a senior mentor to refine the model, incorporating industry-specific insights into project.

Field Study Research in Computer Vision   Aug 2023 - Dec 2023
Virginia Tech   *VA*
- Collaborated on a project to enable autonomous mobility in a roadside trash-collecting robot using open-cv.
- Developed trash detection algorithms to enhance the robot's autonomous navigation and litter collection.
- Led weekly project meetings and delivered presentations on findings to an audience of 30+ faculty and students.

ACHIEVEMENTS

Hackathon Winner   Sept 2024, Feb 2024, Sept 2023
Virginia Tech   *VA*
- **Best Real Estate Hack** (Sept 2024): Developed a map-based accessibility website using MongoDB, Docker, NextJS, and Google Maps API. Integrated OpenAI's LLM for personalized activity planning. Award by CoStar.
- **Best Use of React** (Feb 2024): Built a scalable women's health platform with phase-specific fitness and nutrition plans. Award by Peraton.
- **Best Financial Hack** (Sept 2023): Led backend development for a virtual stock trading app, integrating MongoDB and implementing robust authentication with auth0. Award by Capital One.

PROJECTS

Intelligent QA/Chatbot for Crisis Events | *Python, LangChain, HuggingFace*   Aug 2024 - Present
- Developing a domain-specific chatbot using Large Language Models and Retrieval Augmented Generation.
- Implementing data processing, embedding, and retrieval using LangChain and Chroma DB, integrating open-source LLMs from HuggingFace.

ML-Based Movie Recommendation System | *Python, scikit-learn, BeautifulSoup*   Mar 2024
- Developed a movie recommendation system using machine learning and web scraping techniques.
- Implemented collaborative filtering algorithms using scikit-learn on data scraped from Letterboxd.

TECHNICAL SKILLS

Languages: Java, Python, C, JavaScript, HTML/CSS
Relevant Coursework: Algorithms and Data Structures — Computer Architecture — Comparative Languages — Human-Computer Interaction — Computer Graphics — Intro to Artificial Intelligence