Arnav Sareen

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EDUCATION

University of North Carolina at Charlotte — Charlotte, NC
Bachelor of Science in Computer Science (AI Concentration), Bachelor of Science in Data Science — *2023 – 2027*
Honors: Levine Scholar (*Premier Merit Scholarship*), Chancellor's List — Fall 2023 - Spring 2025 — GPA: 4.0/4.0

Tampere University — Tampere, FI
Exchange Studies — *Jan. 2026 – May 2026*

EXPERIENCE

Incoming Fulbright Canada MITACS Globalink Research Intern — May 2026 –
University of Waterloo — *Waterloo, ON, CA*

Teaching Assistant — August 2025 – Present
UNC Charlotte College of Computing & Informatics — *Charlotte, NC*
- Developing and grading hands-on data mining exercises on clustering, classification, and regression, providing detailed feedback that enhanced student comprehension and problem-solving skills.
- Leading student code review and office hours for a Data Mining course of 70+ students, guiding them through numerous classical machine learning techniques.

E3 Technical Fellow — July 2025 – Present
Codepath — *Charlotte, NC*
- Mentoring 20+ students in computer science and interview prep, resulting in increased technical interview confidence and results through 1:1 guidance sessions.
- Facilitating mock technical interviews, helping students improve problem-solving efficiency and coding quality through targeted feedback and debugging support.

Data Science and Analytics Intern — May 2025 – Dec 2025
Trane Technologies — *Davidson, NC*
- Pioneering a hybrid, ensemble-based recommendation engine via matrix factorization and deep learning collaborative filtering algorithms to drive a projected $3M in sales and increase user engagement by 30%.
- Designing a complementary Retrieval-Augmented Generation (RAG) system leveraging AWS Bedrock Agents and Lambda to query Redshift and generate contextualized responses from enterprise data to increase recommendation effectiveness by 60%.
- Engineering custom metrics to measure recommendation quality by analyzing business impact via transaction patterns, customer overlap, and item taxonomy that prioritizes more relevant and grounded recommendations.

Editor-in-Chief & Web Developer and Media Editor — June 2024 – Present
ETHEL Undergraduate Research Journal — *Charlotte, NC*
- Re-establishing the Undergraduate Research Journal at UNC Charlotte, spearheading the administrative efforts and student outreach efforts behind the University's premier journal for undergraduate research.
- Developing the website for the Journal and curating the digital version of the journal by leveraging WordPress and Bricks Builder, implementing standard SEO and accessibility requirements.
- Reviewing student submissions and providing editorial advice to academic papers from a variety of disciplines, enhancing their clarity and succinctness.

AI & HPC Researcher — August 2023 – Present
Data Intelligence Research (DIR) Lab — Advisors: Dr. Dong Dai, Chris Egersdoerfer — *Charlotte, NC*
- Analyzing the performance of LLMs and their ability to interpret complex and extensive high-performance computing (HPC) logs via a scientific paper-based RAG system, resulting in a heavily reduced hallucination rate.
- Enhancing the performance of a variety of language models for I/O trace log analysis, increasing the consistency and accuracy of its results by 80% through prompt engineering techniques
- Utilizing LLM evaluation techniques to provide a consistent benchmarking interface to track system improvements and modifications, leading to increased development speed and more impactful alterations to the RAG pipeline.

Data Science and AI Engineer Intern — May 2024 – September 2024
Charlotte Works — *Charlotte, NC*

- Developed a custom AI assistant and chatbot, optimizing model performance by 70% through the integration of advanced RAG techniques such as HyDE and Hybrid Retrieval and custom data preprocessing techniques.
- Analyzed labor market data through Python and statistical tools to uncover key labor trends and growth opportunities in Mecklenburg County, leading to actionable suggestions for economic development.

ML Research Assistant   June 2022 – August 2022
PICTure Research Group — Advisors: Dr. Xipeng Shen, Yuanchao Xu   *Raleigh, NC*
- Improved the efficiency of machine learning-based learned indexes in high-write percentage environments through an optimized retraining model, reducing the accuracy degradation from such workloads by 60%.
- Presented novel capabilities of learned indexes at NCSSM Mentorship Research Symposium to a diverse audience.

PUBLICATIONS

C. Egersdoerfer, **A. Sareen**, J. L. Bez, S. Byna, D. D. Xu and D. Dai, IOAgent: Democratizing Trustworthy HPC I/O Performance Diagnosis Capability via LLMs, *2025 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, Milano, Italy, 2025, pp. 322-334, doi: 10.1109/IPDPS64566.2025.00036

C. Egersdoerfer, **A. Sareen**, J. L. Bez, S. Byna, and D. Dai. ION: Navigating the HPC I/O Optimization Journey using Large Language Models, in *Proceedings of the 16th ACM Workshop on Hot Topics in Storage and File Systems (HotStorage)*, Santa Clara, CA, USA, 2024, pp. 86–92. https://dl.acm.org/doi/10.1145/3655038.3665950

TECHNICAL PRESENTATIONS

"Exploring the Performance of AI-Based HPC I/O Performance Diagnoses Across Multiple Models". *State of North Carolina Undergraduate Research and Creativity Symposium*, November 2025. Elon, NC (Poster)

"I/O Navigator: Enhancing and Benchmarking LLMs for HPC I/O Performance Diagnosis". *National Conference on Undergraduate Research*, April 2025. Pittsburgh, PA (Poster)

"ION: Navigating the HPC I/O Optimization Journey using Large Language Models". *Undergraduate Research Initiative Final Poster Presentation*, May 2024. Charlotte, NC (Poster)

"ION: Navigating the HPC I/O Optimization Journey using Large Language Modelss". *UNC Charlotte Undergraduate Research Symposium*, April 2024. Charlotte, NC (Poster)

AWARDS

George Barthalmus Undergraduate Research Award: The George Barthalmus Undergraduate Research Awards has been developed to promote early involvement in the research process through support of sophomores in a research project of their design *Awarded 2024*
Levine Scholarship: The Levine Scholars Program is UNC Charlotte's premier undergraduate merit scholarship. Scholars exemplify intellectual curiosity, commitment to community service and the capacity for ethical leadership. The program provides funding for up to eight semesters of educational costs including room and board, as well as support for four summer experiences in outdoor leadership, nonprofit service, pre-professional development and international education. *Awarded 2023*
National Cyber Scholar with Honors: Competed for a top score against thousands of high school students across the nation by solving real-world cybersecurity problems. Additionally, completed and passed the GIAC Foundational Cybersecurity Technologies (GFACT) exam and obtained one of the highest 500 scores within the National Cyber Scholar cohort. *Awarded 2023*

TECHNICAL SKILLS AND OTHER AFFILIATIONS

Courses: Data Structures & Algorithms, Computer Systems, Database Design, Operating Systems & Networks, Natural Language Processing, Artificial Intelligence, Machine Learning, Data Mining, Applied Regression, Multivariate Analysis
Languages: Python, Java, SQL, C/C++, SAS, JavaScript, HTML/CSS, RISC-V
Developer Tools: Git, VS Code, AWS Sagemaker, AWS Bedrock, AWS Redshift, BigQuery, PyCharm, IntelliJ
Libraries + Tools: Pandas, Polars, NumPy, Matplotlib, DsPy, ChromaDB, Plotly, Scikit-Learn, spaCy, BeautifulSoup, Streamlit, Selenium, Flask, Git
Clubs and Organizations: Sports Analytics Club Member, Charlotte AI Research Club Member