Christian P. Munley

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EDUCATION

University of Delaware Newark, DE

College of Engineering

Bachelor of Science in Computer Science, May 2024

College of Arts and Science

Bachelor of Science in Applied Physics, May 2024

SKILLS

- Programming - C, C++, Fortran, Java, Python, Bash, React, Typescript, Javascript, Docker, Git, Ardiuno
- Biophysics - Molecular Dynamics Simulation, NAMD, Machine Learning
- HPC - Parallel Programming, OpenACC, Benchmarking, Large Language Models, Slurm

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WORK/EMPLOYMENT EXPERIENCE

Computational Research and Programming Lab Newark, DE

Undergraduate Researcher May 2016 - December 2019, August 2021 - Present

- Under the mentorship of Dr. Sunita Chandrasekaran, I am exploring the use of large-language models (LLMs) in code-generation based on natural language specification of programming languages.
- Working with a team to develop a validation-verification test-suite for OpenACC to validate vendors conformance to the programming language specification. Publication and poster on this work, which placed 3rd overall in the SC22 ACM Student Research Competition.
- Studying parallel computing models, including OpenACC, OpenMP, and MPI, developing a framework for porting parallelized applications using Docker software containers, and benchmarking university computing systems with SPEC HPG benchmark.

Lyman Biophysics Research Group Newark, DE

Undergraduate Researcher August 2021 - Present

- Under mentorship of Dr. Edward Lyman, I am studying transmembrane protein surface chemistry using machine learning techniques.
- Developed a workflow for running parallel molecular dynamics simulations on local systems. Calculating and analyzing lateral pressure profiles of membrane simulations to study elastic dynamics.
- Actively participating in weekly research meetings, offering ideas and collaborating on various projects.

UD Faculty Commons / Academic Technology Support Newark, DE

Undergraduate Staff June 2023 - Present

- Developing study tools for students using LLMs with lecture transcripts and course materials to create Interactive quizzes, notecards, outlines, and more.

University of Delaware Newark, DE

Academic Undergraduate Teaching Assistant August 2023 - Present

- Ran lab sessions for two section in Introductory Physics (PHYS221)
- Held physics help center hours, offering mentoring and academic support to students.

University of Delaware Newark, DE

Academic Undergraduate Teaching Assistant August 2022 - December 2022

- Presented bi-weekly lectures and facilitated in-class activities to engage students in General Computer Science for Engineers (CISC 106).
- Collaborated with faculty, fellow teaching assistants, and staff to plan lectures, and conducted office hours for one-on-one assistance.

University of Delaware Newark, DE

K-12 Summer Engineering Internship June 2017 - August 2017

- Worked with Dr. Jack Puleo to develop a low-cost, versatile camera for monitoring beach erosion using Arduino.

PUBLICATIONS / AWARDS

- Analysis of Validating and Verifying OpenACC Compilers 3.0 and Above, and poster earning third place in the SC22 ACM Undergraduate Research Competition.
- Winner at University of Delaware Data Science + AI Hackathon 2023, creating generative ML models to predict precipitation patterns from various existing prediction databases and ground-truth data.
- Best poster overall at University of Delaware DARWIN research symposium 2022.
- Winner at StuyHacks hackathon in 2020 for creating a website for first-responders to collaborate on.
- Third place overall at HopHacks Hackathon at John Hopkins University in Spring 2019 for a team project integrating infrared camera, video, and machine learning to detect hand position related to carpal tunnel syndrome and provide feedback.
