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Benjamin A. Carman
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Permanent Address
12800 Florida Ave NE
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Education

Honors Tutorial College, Ohio University, Athens, OH May 2021 Conferral
Bachelor of Science, Double Major: Computer Science and Mathematics | 4.0 GPA

Research and Creative Activity

REU Research Assistant in Machine Learning August 2020 – May 2021
Ohio University, Electrical Engineering and Computer Science Department, Athens, OH
In this research position I am implementing/evaluating Recurrent Neural Networks on a photonic architecture.

Machine Learning Research Assistant May 2020 and August 2020
Ohio University, Computer Science Department, Athens, OH
In this research position with professors Dr. Bunescu and Dr. Juedes, I implemented a recurrent neural network in PyTorch for a novel natural language processing task, wrote a context-free grammar in Rust to mechanically generate training data, and achieved nearly 100% test accuracy by connecting the model to Weights & Biases and Tensorboard for efficient hyperparameter tuning.

REU Research Assistant in Software Engineering May 2020 – August 2020
Carnegie Mellon University, Institute for Software Research, Pittsburgh, PA
In this National Science Foundation (NSF)-sponsored Research Experience for Undergraduates in Software Engineering (REUSE) under Dr. Fei Fang, I researched applications of multi-agent reinforcement learning (RL) to combat poaching. Throughout the summer, I designed and implemented a multi-agent game environment and visualization using OpenAI Gym to model poachers seeking targets in the wild while rangers and drones try to catch/deter the poachers. I then evaluated and optimized coordinated defender strategies using RL algorithms like MADDPG and PPO.

Summer Data Scientist June 2020 – August 2020
Tufts University, Metric Geometry and Gerrymandering Group, Boston, MA
This was a summer data science position under Dr. Moon Duchin of the Metric Geometry and Gerrymandering Group. This included participation in two intensive summer trainings, the Geodata Bootcamp and Mapping Training, to develop data wrangling and analysis skills for voting rights projects. After these trainings, I continued working for the group to digitize PDF precinct maps of Puerto Rico and merge election data using QGIS, Pandas, & GeoPandas for future mapmaking and analysis.

DAAD RISE Germany Research Intern May 2019 – August 2019
Universität Bonn Institut für Informatik, Bonn, Germany
This was a research internship sponsored by German Academic Exchange Service (DAAD). This internationally competitive program funded research at the University of Bonn in Germany during summer 2019. Under Dr. Mathias Mnich and PhD student Simon Omlor, I studied n -fold integer linear programming (ILP) and contributed C++ implementations of new solving algorithms for these problems that achieved a speedup by a factor of dimensionality over previous n -fold ILP solvers.

REU Research Assistant in Software Verification May 2018 – May 2019
Ohio University, Electrical Engineering and Computer Science Department, Athens, OH
In this National Science Foundation (NSF)-sponsored Research Experience for Undergraduates (REU) at Ohio University under Dr. Gordon Stewart, I performed research in the software verification of the multiplicative weights update (MWU) algorithm. Throughout the year, I contributed a Python linear classification application to a verified MWU client and wrote proofs and code for a completely verified linear classifier in COQ.

Academic/Professional Honors and Grants

National Science Foundation (NSF) Research Experience for Undergraduates (REU)	Summer 2020
<ul style="list-style-type: none"> • 11% acceptance • A \$7,200 stipend to research in the Institute for Software Research at Carnegie Mellon University 	
DAAD German Academic Exchange Service RISE Research Grant	Summer 2020
<ul style="list-style-type: none"> • <19% acceptance • Cancelled due to COVID-19 	
Baer Prize Recipient	Spring 2020
<ul style="list-style-type: none"> • \$1000 prize from Honors Tutorial College awarded for excellence in transdisciplinary thinking 	
Dean's List	Fall 2017 – Spring 2019
DAAD German Academic Exchange Service RISE Research Grant	Summer 2019
<ul style="list-style-type: none"> • <16% acceptance • A €3,385 stipend for a research internship in Bonn, Germany and conference in Heidelberg 	
National Science Foundation (NSF) Research Experience for Undergraduates (REU)	2018 – 2019
<ul style="list-style-type: none"> • An \$8,000 stipend to research at Ohio University from Summer 2018 through Spring 2019 	
National Eagle Scout Association \$25,000 Cooke Academic Scholarship	Summer 2018
OHIO Premier Scholarship—Full Tuition	Spring 2017
Eagle Scout	December 2016

Work Experience

Summer Camp Spanish Counselor	June 2017
Ohio Foreign Language Association	
In this role I taught and modeled Spanish language and culture to over 20 kids between the ages 6 and 17 for a week-long language immersion camp.	

Skills

Programming Languages: C++ & Python (Expert); Coq, Rust, R, HTML, & CSS (Familiar)

Frameworks: Pytorch, Scikit-learn, NumPy, SciPy, Seaborn, Matplotlib, Pandas, GeoPandas, OpenMP, OpenMPI, OpenCV, Gym

Tools: Git, Tensorboard, Weights & Biases, Doxygen, QGIS, Mac, Windows, Linux

Languages: Spanish (Proficient), German (Beginner)

Expert in modeling & constrained optimization with AMPL & Gurobi APIs

Expert in several machine learning, deep learning, & reinforcement learning algorithms

Strong written and oral communication, servant leadership, and teamwork

Publications

Carman, Benjamin. "Your Firearm or Your Friend: The Choice Killing Americans." *The Writing Center Review*, Vol. 22, Iss. 1, Article 1, 2017.

See my Github at <https://github.com/benjamin carman> for code and reports on various projects that have been made publicly available. Please contact me for information on others which are still in progress.

Professional Affiliations/Memberships

Association of Computing Machinery
 Mathematical Association of America
 National Eagle Scout Association

Interests

- Singing in choirs and in musical theater
- Playing the saxophone in bands and as a soloist in church services, etc.
- Enjoying water sports like small-boat sailing and kayaking
- Traveling and meeting people from diverse cultures around the world
- Applying STEM to social & environmental issues, such as redistricting and eliminating gerrymandering

Campus Organizations

University Curriculum Council Fall 2018 – Current
 Sitting Member

In this University President-appointed role I attend monthly meetings regarding university-wide curriculum updates such as course additions/deletions, requisite changes, general education reform, and program changes.

Singing Men of Ohio Spring 2020 – Current
 Treasurer

Manage finances and budget including fundraising for annual Spring Tour which 40-60 members will attend.

Ohio University Student Senate Fall 2017 – Current
 Senator At-Large (Fall 2019—Spring 2020)

Served on the University Life Commission representing all Ohio University student constituencies. Worked on a broad spectrum of student-focused issues including lobbying state officials on legislation impacting student safety and streamlining relations between student organizations and the university.

Residence Life Senator and Co-Internship Director (Fall 2018—Spring 2019)

Served on the Residence Life Commission representing constituents living on Ohio University's campus. Worked with university administration to improve residence halls, dining halls, and campus safety. Lead and mentored a group of 14 new Student Senate Interns as a Co-Internship Director.

Ohio University College Democrats Fall 2017 – Current
 Treasurer and Fellow for Ohio Democratic Party (Fall 2018—Spring 2019)

Managed the organization's budget including disbursements, deposits, and fundraising. Planned and fundraised for an annual DC trip which 46 members attended. Regularly planned voter registration events, phone banks, and elected official networking events.

Other Memberships:

Association of Computing Machinery—OU Chapter	Fall 2017 – Current
Ohio University Math Club	Fall 2017 – Current
Association of Women in Mathematics	Fall 2018 – Current
Bridge Campus Ministry, Christ Lutheran Church	Fall 2017 – Current
Singing Men of Ohio	Fall 2017 – Current
Section Eight Elite Acapella Collective	Fall 2018 – Current
University Singers	Fall 2017 – Spring 2019
Under the Elms Summer Concert Band	Summer 2018

Community Service

Teen Court, Stark County Family Court

Jan. 2014 – May 2017

Through this program I served over 300 service hours to countless peers facing criminal offenses. Learned and exemplified the model of restorative justice while learning about community diversity and the sheer value of empathy and humanity.

Boy Scouts of America

2011 – Current

Served hundreds of community service hours through pancake breakfasts, roadside cleanups, food distributions, and so many more. I earned my Eagle Scout rank after leading a project in which we designed and created seven unique carnival games for a local church's family-based community activities. This project accumulated over 200 hours of service. Currently serve as an adult leader.