

# Austin Marcus

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## Education

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### Binghamton University

*Masters of Systems Science, GPA - 4.0*  
Certificate in Complex Systems Science and Engineering

**Binghamton, NY**  
*Aug 2021 – May 2023 (Expected)*

### The Pennsylvania State University

*Bachelor of Computer Science, GPA - 3.95*  
Minor in Physics and Minor in Philosophy  
Dean's List: Fall 2017 - Spring 2021

**University Park, PA**  
*Aug 2017 – May 2021*

## Certificates

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### Santa Fe Institute

*Introduction to Complexity*  
Asynchronous Online Course

**Virtually Hosted**  
*Fall 2019*

## Research Experience

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### Graduate Researcher

*Dr. Hiroki Sayama, Department of Systems Science*

**Binghamton University**  
*Aug 2021 – Present*

- Motivated and developed qualitative and quantitative primary research agendas in collaboration with research advisor.
- Developed particle simulation model in order to conduct a simulated thought experiment addressing issues in Artificial Life and the Philosophy of Biology.
- Engaged with lab members to give and receive constructive feedback on projects and to generate and connect new ideas.

### Undergraduate Researcher

*Dr. Mark Sentesy, Department of Philosophy*

**The Pennsylvania State University**  
*Jan 2021 – May 2021*

- Initiated a long-term, independently motivated project to complement mathematical and computational approaches to Artificial Life and Complex Systems issues by conducting a review of the history of relevant philosophical thought on living things.
- Closely read philosophical texts related to issues of living things and dynamic systems, such as Aristotle's *On the Soul* and Merleau-Ponty's *The Structure of Behavior*.
- Articulated difficult philosophical concepts present in the texts through short-essay writing.

### Undergraduate Research Assistant

*Dezhe Jin Group, Department of Physics*

**The Pennsylvania State University**  
*Feb 2020 – Aug 2020*

- Conducted primary and secondary research to develop a machine learning system to identify parrot individuals by voice.
- Designed experiments to effectively reveal factors affecting speaker-identification accuracy.
- Selected appropriate algorithm implementations considering limitations of computing hardware.
- Concluded problem should be approached more generally by first identifying the most appropriate ML method using data complexity measures.

- Consolidated findings in academic report to facilitate future research in the lab.

## Technical Experience

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### Graduate Research Associate

*Watson WISE iA Project, Dr. Yoon, SSIE Department*

**Binghamton University**

*Aug 2021 – May 2022*

- Collaborated with a team of 8 students and industry partners to simulate and evaluate Central Fill Pharmacy installations for several pharmaceutical corporations.
- Developed and debugged software for running installation simulation models in Demo3D.
- Conveyed relevant implications of simulation models to industry partners.
- Designed and implemented simulation experiments based on industry desiderata under tight timelines.

### Undergraduate Research Assistant

*DEPEND Lab, Dr. Hallquist, Department of Psychology*

**The Pennsylvania State University**

*Dec 2019 – Aug 2020*

- Developed software to process data obtained from a human-subject research study.
- Designed and extended data validity checks and fMRI processing code in Python and Bash.
- Coordinated with a 6-member team to develop an R package implementing a general framework for study data verification and processing.
- Presented design ideas during team meetings using informal write-ups and live code demonstrations.

### Software Engineering Intern

*Lockheed Martin, Squidworks*

**Manassas, VA**

*May 2019 – Aug 2019*

- Researched computer scheduling algorithms to define product use case and challenges.
- Coordinated closely with 10-member team in an AGILE software development environment.
- Became team expert on Kubernetes orchestration manager, documenting and presenting findings.
- Installed OS, configured network and customized software on 10 high-performance servers.

### Student Space Programs Lab

*Student Training Program*

**The Pennsylvania State University**

*Aug 2018 – Dec 2018*

- Participated in a semester-long group competition to construct a model rocket system to record in-flight data.
- Effectively communicated with team of 5 to identify challenges, delegate work, synchronize project components and produce conceptual design.
- Personally responsible for writing code to operate in-flight radio and data recording equipment, including GPS and atmospheric data.

## Academic Experience

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### Student Grader

*Computer Science and Engineering, Dr. Martin Fürer*

**The Pennsylvania State University**

*Jan 2021 – May 2021*

- Graded efficiently and accurately under tight deadlines, while balancing other student responsibilities, for a computational theory introductory course.
- Produced solutions and rubrics for individual exam questions, and rubrics for homework questions.
- Developed meaningful rubrics by determining the essential issue being tested in each problem.

## Conferences & Talks

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**Apr 2022:** Fifth Northeast Regional Conference on Complex Systems, Buffalo, NY — Contributed

talk, *Motion Theories of Life*

## Honors & Awards

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**Jul 2021:** ALife Student Essay Competition — Runner up for best essay

**Jul 2020:** ALife Student Scholarship Award — Waived conference attendance fee

## Software Skills

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**Very Familiar:** C, Python, Git, Linux, Bash, Julia

**Somewhat Familiar:** Go, L<sup>A</sup>T<sub>E</sub>X, Java, Network Management, Matlab, R