

Patrick Phillips

TS/SCI Clearance



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ACADEMICS

University of Chicago

2022 - 2023

M.S. in Computer Science with Specialization in Data Analytics

- **GPA 3.86/4.0.** Completed while working full-time.
- Relevant Coursework: Causality with Machine Learning, Cloud Computing (AWS), Advanced Algorithms, Unsupervised Learning and Data Analysis, C/C++ for Advanced Programmers, Computer Systems

University of Rochester

2017 - 2021

B.S. in Computer Science, B.S. in Applied Mathematics, B.A. in Physics, B.A. in Engineering Science

- **GPA 3.96/4.00,** Dean's List all eligible semesters, *magna cum laude.*
- New York State Academic Excellence Scholarship, American Council of Engineering Scholarship.
- Relevant Coursework: Machine Learning, Linear Algebra, Artificial Intelligence, Complex Analysis, Discrete Mathematics, Computer Vision, Computational Complexity, Multidimensional Calculus

SKILLS

- Experienced in C# (.NET), Python, Java, C, C++, JavaScript, SQL, AWS, Kubernetes, Selenium, AI/ML, Ruby on Rails, TensorFlow, SciPy, scikit-learn, Pandas, PyTorch, R, MATLAB, Linux/UNIX terminal, Windows Server, Microservices, MongoDB, Jenkins, Docker, CI/CD, Agile, Git.

TECHNICAL EXPERIENCE

General Dynamics Information Technology

(Remote)

Sr. Software Developer

October 2023 – Present

- Supporting USSOCOM operations as a full stack web developer in an Agile team. Leading migration of Ruby on Rails application suite to a Kubernetes cluster using AWS services.

Riverside Research

Centreville, VA (Remote)

Fullstack Software Developer

January 2021 – October 2023

- Supporting the Collection Planning Suite, a large-scale web application used for satellite scheduling. Tools I use include C#, .NET, Oracle SQL, JavaScript, HTML, Jira, Agile, Windows Server, and AWS.

AI/ML Scientist I

April 2020 – January 2021

- Investigated applications of AI/ML to operations in space asset planning. Designed and developed a novel optimization scheme for satellite scheduling, with a finished prototype in Python.

Argonne National Laboratory

Chicago, IL

Machine Learning and Quantum Chemistry Internship

May 2022 – October 2022

- Researched Auger spectra decay prediction based on molecular structure in support of the Quantum Chemistry and Molecular Physics group. This work involved implementing and managing large scale deep learning systems in Python.

University of Chicago

Rochester, NY

Computer Science Teaching Assistant

September 2022 – December 2022

- Lead focused problem sessions and reviewed course materials for graduate level Algorithms (MPCS 55001).

University of Rochester

Rochester, NY

Computer Vision and Reinforcement Learning REU

May 2020 – August 2020

- Combined concepts from state-of-the-art reinforcement learning, game theory, and meta learning to develop an agent specialized in two player zero sum games.

Computational Complexity Research Internship

January 2021 – May 2021

- Researched foundational problems in complexity theory, with a focus on restricted counting classes.

Computer Science Teaching Assistant

September 2018 – May 2021

- Lead problem sessions and graded assignments for Design & Analysis of Efficient Algorithms (CS 282), Computational Complexity (CS 286), and Intro to Computer Science (CS 171).

Technical University of Hamburg (TUHH)

Hamburg, Germany

DAAD Research Internship

May 2019 – August 2019

- Researched the ‘informative path planning problem’ where an agent aims to efficiently move around a scalar field while taking measurements to quickly learn a Bayesian estimation of the true field. This work used Python simulation as well as an underwater autonomous vehicle.

PERSONAL PROJECT HIGHLIGHTS

- Implemented several ML algorithms from scratch including [backpropagation](#), [Expectation Maximization for a HMM and for Mixture of Gaussians](#), K-Nearest-Neighbors, variations of genetic algorithms, and more. These were done in Python and can be found on my [Github](#) along with many other projects.
- Completed the [projects](#) in *Computer Systems: A Programmer's Perspective: Robert O'Hallaron* as part of my computer organization course.
- Collaborated on many data science projects with specific applications in recommender systems, language processing, medical diagnosis classification and more as a member of the [Undergraduate Data Science Council](#).
- Created chess, poker (Texas-Hold 'em), and [connect-4 AI players](#) using tree search algorithms with alpha-beta pruning, Monte Carlo search, and other added heuristics specific to the respective games, in Java.
- Using Kotlin, Jetpack Compose, Python, machine learning, diffusion models, and RESTful APIs I developed the Android app Holophone for AI Music generation and AI Music to Video generation. Available on the Google Play Store.
- Using Angular, Python, and Firebase hosting, I developed my wife Michaela Chan's art website <https://michaelachan.com/>.

RESEARCH PAPERS

- Patrick A. Phillips, Jing Bi, Jing Shi, Chenliang Xu. "Reinforcement Learning in Two Player Simultaneous Action Games" University of Rochester. (2020) https://patrickphillips.page/pdfs/RL_meets_Nash_Eq.pdf
- L. Hemaspaandra, M. Juvekar, A. Nadjimzadah, and Patrick A. Phillips. "Gaps, ambiguity, and establishing complexity-class containments via iterative constant-setting." (2021) <https://arxiv.org/abs/2109.14764>

PROFESSIONAL ASSOCIATIONS

- National Society of Physics Students, U of R Society of Physics Students,
- U of R Undergraduate Data Science Council
- ICML, MMLS, AI@RIT Summit, Generative AI Summit, GEOINT conference attendee or presenter
- Phi Beta Kappa honor society member
- United States Geospatial Intelligence Foundation member