Zachary **Robertson**

Graduate Student · Research Assistant

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"Play is the highest form of research."

Education

University of Illinois at Urbana-Champaign

Champaign, U.S.

Ph.D. in Computer Science

Aug. 2020 - Present

- Specializing in reinforcement learning and machine learning
- Awarded GEM fellowship
- Awarded Science Excellence Fellowship

University of Chicago

Chicago, U.S.

B.S. in Computational and Applied Math

Oct. 2016 - Present

- Working towards Honor's Thesis
- Jackie Robinson scholarship award for minority students

LoneStar Community College

Spring, TX, U.S.

Associate Degree in Science

Oct. 2013 - May. 2016

- President's List
- Home schooled with dual enrollment at local community college from 14-16

Skills

Programming	Python, C++, LaTeX
Machine Learning	Keras, PyTorch
Math	Analysis, Linear Algebra, Statistics, Game Theory

Experience

Lam Research

Fremont, U.S.

Software Engineer

June 2020 - Aug. 2020

- Lam is a major player in the design, manufacture, marketing, and service of semiconductor processing equipment used in the fabrication of integrated circuits
- Applied knowledge of reinforcement learning and machine learning to optimize the production flow of semi-conducting wafers
- Used Python, Open AI Gym, and Tensorflow

Robot Intelligence through Perception Lab at TTIC

Chicago, U.S.

Research Assistant

Jun. 2019 - Present

- Implemented a model to do sparse-depth completion on a robot using PyTorch, Docker, and SLURM.
- Trained a simulated UR5 arm to pick up blocks from a table with natural language using PyTorch, OpenGym, and Mujoco.
- Engaged in theoretical study of reinforcement learning using regret based approach for Honor's Thesis

Exo-Planets Group at UChicago

Chicago, U.S.

Research Assistant

June 2017 - Oct. 2018

- Worked on increasing calibration precision using machine learning (EM and pattern matching) to help align known spectra to those reported on the spectrograph pixel output
- Published a paper describing more efficient calibration software for spectrographs

Allen and Company LLC.

New York, U.S.

Analyst

June 2018 - Aug. 2018

- Allen and Co. is a boutique investment banking firm that has advised on deals such as Facebook's acquisition of WhatsApp (2014) and hosts the annual Sun Valley Conference in Idaho
- Brought domain knowledge to help evaluate quantum computing startups and cryptocurrencies, automated formulaic internal reporting, and analyzed investor sentiment

Algorithmic Dynamics Lab

Stockholm, Sweden

Software Contributor

June 2018 - Aug. 2018

- Developed an algorithm to approximately calculate algorithmic complexity for array data structures using Python.
- Completed remote course-work on algorithmic information dynamics hosted by the Santa Fe Institute and taught by Hector Zenil

Honors & Awards

2018	**Recipient,** Dean's List	*UChicago*
2017	**Winner,** Illinois Blockchain Hackathon	*Chicago/Urbana*
2016	**Scholar,** Jackie Robinson Foundation	*New York*

Extracurricular Activity

Alignment Newsletter

CHAI

Contributor

Sept. 2019 - Present

- Wrote summaries and opinions on advances in machine learning for the Alignment Newsletter

Inter-House Council

UChicago

Chair of Philanthropy Committee

Oct. 2016 - June 2018

- Planned and implemented an update to the Saturday night meal pilot program for students with financial need.
- Used a portion of the saved money to help feed local people in need.

Chicago Maroon

UChicago

Data Analysis & Writer

Oct. 2016 - 2018

- Conducted student polls and analyzed the results

Publications and Talks

UCISTEM Undergraduate Research Symposium

Chciago, US

"Behavioral Cloning from Observation"

Oct. 2019

- Displayed robot that could learn from visual demonstrations.
- Compared state of the art methods in the Atari videogame environment.

TTIC Final Class Presentation (Unsupervised Learning)

Chicago, US

"SVCCA: Discovering Representation Structure in Neural Networks"

Mar. 2019

- Used singular value decomposition (SVD) and canonical correlation analysis (CCA) to analyze activation patterns in artificial neural networks trained to classify images.

Publications of the Astronomical Society of the Pacific

Chciago, US

"Echelle++, a Fast Generic Spectrum Simulator"

Dec. 2018

- We present the software package, Echelle++, an open-source C++ code to simulate realistic raw spectra based on the Zemax model of any spectrograph
- Contributed to development of ray tracing algorithm