

# James Oswald

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## Research Interests

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**Artificial Intelligence** Automated Reasoning, Machine Learning, Logic Based AI  
**Logic** Modal Logics, Natural Deduction, Description Logics

## Selected Skills

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**Programming Languages** C++, Python, Java, C, Javascript  
**AI Technologies** Tensorflow, Keras, PyTorch, Matplotlib, Numpy, CUDA, MPI  
**Web Technologies** Node.js, WebGL, 3JS, WebAssembly, Express.js

## Education

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### Rensselaer Polytechnic Institute

Troy, NY

PHD IN COMPUTER SCIENCE (PURSUING)

Aug. 2021 - PRESENT

- Concentration in Artificial Intelligence
- Breadth in Theory of Computation and Systems/Software
- Advised by Prof. Selmer Bringsjord
- Graduate Researcher in the Rensselaer Artificial Intelligence and Reasoning (RAIR) Lab
- 4.0 GPA

### The State University of New York at Albany (SUNY Albany)

Albany, NY

B.S. IN COMPUTER SCIENCE AND MATHEMATICS

Aug. 2018 - May. 2021

- Double Major in Computer Science and Mathematics
- Undergraduate Researcher in the Data Mining and Management (DMM) Lab
- Graduated *summa cum laude* (3.89 GPA)

## Funded Research

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### Meta-Cognitively Perceptive Artificial Teammates

Troy, NY

ADVISOR/PI: SELMER BRINGSJORD (RPI)

May. 2022 - PRESENT

- Integration of RAIR Lab Reasoning tools (Shadow Prover, Spectra) with the ARCADIA Cognitive Architecture from the NRL.
- Development of demos of our architecture on Metaforms and Mini-Grid
- Funded by ONR Grant #N00014-22-1-2201

### Generative Machine Learning for Nanomaterial Design

Albany, NY

ADVISORS/PIs: PETKO BOGDANOV (SUNY ALBANY), STACY COPP (UC IRVINE)

Jan. 2021 - Aug. 2021, Jan. 2022

- Developed novel attribute-regularized variational autoencoder (ARVAE) models for intelligent design of Ag-DNA nanoparticles.
- Implemented ARVAE models in Tensorflow and Pytorch using custom LSTMs.
- Designed robust visualization tools using WebGL and Matplot Lib.
- Funded By NSF Grant #2025793

## Publications

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### CONFERENCE PAPERS

1. **James Oswald.** "Market Prediction as a Task for AGI Agents", Artificial General Intelligence, 2022
2. Selmer Bringsjord, Naveen Sundar Govindarajulu, John Slowik, **James Oswald**, Michael Giancola, John Angel, Shreya Banerjee, & Aiden Flaherty. "PERI.2 Goes to PreSchool and Beyond, in Search of AGI", Artificial General Intelligence, 2022
3. Fariha Moomtaheen, Matthew Killeen, **James Oswald**, Anna González-Rosell, Peter Mastracco, Alexander Gorovits, Stacy M Copp, Petko Bogdanov. "DNA-Stabilized Silver Nanocluster Design via Regularized Variational Autoencoders" ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2022

### BOOK CHAPTER

1. Selmer Bringsjord, Naveen Sundar Govindarajulu, **James Oswald.** "Universal Cognitive Intelligence, from Cognitive Consciousness, and Lambda" (Under Review)

### INVITED PRESENTATIONS

1. **James Oswald.** "Market Prediction as a Task for AGI Agents (Extended)", AGI in FinTech (AGIFT) Workshop, 2022

## Awards

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**Presidential Award for Undergraduate Research**

Jun. 2021

**SUNY Albany Dean's List**

Spring. 2019 - Spring. 2021

**SUNY Albany Presidential Scholarship**

Aug. 2018 - May. 2021

**Eagle Scout**

Sep. 2018

## Professional Memberships

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**Institute of Electrical and Electronics Engineers (IEEE)**

Jan. 2019 - Present

- Graduate Student Member (Jan. 2022 - Present)
- Undergraduate Student Member (Jan. 2019 - Jan. 2022)

**SUNY Albany IEEE Student Chapter**

Oct. 2019 - Present

- Alumni Mentor (Jun. 2021 - Present)
- Chair (May. 2020 - Jun. 2021)
- Junior Chair (Feb. 2020 - May. 2020)
- Member (Oct. 2018 - Feb. 2020)

**SUNY Albany Presidential Honors Society**

Jan 2019 - May 2021

- Full Member (Jan 2019 - May 2021)