

# Angel Sylvester

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## Summary

5th-year PhD candidate specializing in AI/Robotics at the University of Minnesota with over 5 years of combined research and industry expertise in AI model development. Currently advancing a thesis centered on enhancing explainability through innovative applications of social learning and adaptive techniques in multi-agent systems.

## Education

<b>Ph.D</b>	<b>University of Minnesota</b> , Computer Science (AI/Robotics) <ul style="list-style-type: none"><li>• <b>Coursework:</b> Robotics, Advanced Alg and Data Structures, VR and 3D Interaction</li></ul>	Sept. 2020 to present
<b>BS</b>	<b>Macalester College</b> , Computer Science and Chemistry <ul style="list-style-type: none"><li>• <b>Coursework:</b> Multi-variable Calculus III, Theory of Computation, Discrete Mathematics, Linear Algebra, Bodies/Minds: AI Robotics, Intro to Artificial Intelligence.</li></ul>	Sept. 2016 to May 2020

## Experience

<b>Honeywell</b> , Graduate AI/ML Intern <ul style="list-style-type: none"><li>• Applied Generative AI techniques as part of the MagGPT project to enhance Magnetic Anomaly Navigation accuracy under multiple environmental conditions.</li><li>• Conducted comprehensive literature reviews and developed methods to fine-tune low-resolution magnetic anomaly data, ensuring high accuracy levels.</li><li>• Collaborated with a multidisciplinary team to address deployment challenges and optimize technology solutions.</li></ul>	MN, USA June 2024 to Aug. 2024 3 months
<b>University of Minnesota</b> , Graduate Researcher <ul style="list-style-type: none"><li>• Investigated the usage of embodied evolution and bayesian principles to aid to development of online adaptable controllers in multi-robot systems.</li><li>• Investigated ways to exploit communication and social learning mechanisms to aid in coordination between multiple robots.</li><li>• Mentored students ranging from high school level to masters students to development of independent research projects.</li></ul>	MN, USA Sept. 2020 to present 3 years 11 months
<b>University of Minnesota</b> , Graduate Teaching Assistant <ul style="list-style-type: none"><li>• Managed and supervised a team of 30 undergraduate students, ensuring smooth coordination of responsibilities.</li><li>• Acted as a liaison for undergraduate students, providing support and guidance on coursework and addressing general inquiries.</li></ul>	MN, USA Sept. 2020 to present 3 years 11 months
<b>University of Minnesota</b> , Graduate Teaching Instruction <ul style="list-style-type: none"><li>• Led instruction for an undergraduate class of approximately 30 students in the introductory Python course, CSCI 1133.</li><li>• Coordinated and facilitated one-on-one sessions between students and provided support to teaching assistants, ensuring effective resolution of semester-long issues.</li></ul>	MM, USA Jan 2022 to May. 2022 5 months

## Publications

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### An empirical characterization of ODE models of swarm behaviors in common foraging scenarios

2023

John Harwell, **Angel Sylvester**, Maria Gini

[0.1007/s10514-023-10121-9](https://arxiv.org/abs/0.1007/s10514-023-10121-9) [🔗](#)

## Projects

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### Online Adaptation for Multi-robot Systems

2024

- As part of thesis project, developed multi-robot environment to assess performance as online adaptations are made during foraging task.
- Used python.

### Sequential Social Dilemmas in multi-agent reinforcement learning

2024

- Investigated Bayesian-based intuition in reward shaping to guide emergence of social consciousness when addressing sequential social dilemmas. PPO algorithm implemented from scratch.
- Used Python.

### Multi-user Interface in VR

2020

- Using Babylon.js and Matrix, developed message-passing system to aid in synchronization of multi-user environments.
- Used Node.js, javascript, typescript.

## Technologies

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**Languages:** Java, Python, C, C++, R, SQL, XML/XSL,  $\text{\LaTeX}$ , Html, css, JavaScript, Typescript

**Software:** Ionic, Netlogo, ARGoS, Webots, Babylon.js, ROS

**High-performance Computing (HPC):** SLURM, conda, Docker

**Machine Learning:** tensorflow, pytorch, keras, scikit-learn