

# Angel Sylvester

*Curriculum Vitae*

## Contact:

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## EDUCATION

### University of Minnesota, Minneapolis — *PhD*

SEPT 2020 - PRESENT

Ph.D candidate in Artificial Intelligence/Robotics

### Macalester College, St. Paul — *B.A*

SEPT 2016 - MAY 2020

Chemistry and Computer Science (with honors) double major

## EXPERIENCE

### University of Minnesota, Minneapolis — *Graduate Researcher*

SEPT 2020 - PRESENT

- Explored biological/chemical-inspired implementations of swarm-based foraging scenarios from a theoretical and simulation-based perspective
- Integrated Ordinary Differential Equation (ODE) and explored bio-inspired mechanisms at the environmental level to model long-term steady state behavior of large-scale robot foraging behavior
- Employed elements of evolutionary learning (genetic algorithms) and reinforcement learning in a multi-robot based simulation to develop a framework committed to advancing the adaptation and learning necessary for foraging/exploration in a variety of different environments

### SEISMIC, Minneapolis — *Data Analyst Fellow*

MAY 2021 - PRESENT

Collaborated with other SEISMIC institutions to implement a hierarchical linear model in R to determine the relationship between demographic factors (ie. first generation status, URM, gender) and performance

### University of Minnesota, Minneapolis — *CSCI 1133 Instructor*

JAN 2022 - MAY 2022

- Instructor for CSCI 1133 (Introduction to Computing and Programming Concepts) for a class for ~40 students covering fundamentals of Python programming, developing coursework, lecture plans, and oversaw weekly labs alongside TA's

## PROGRAMMING LANGUAGES

Machine Learning:

tensorflow, keras,

scikit-learn, pytorch

Programming Languages:

Python, Java, C, Typescript,

HTML, CSS, R

Frameworks: ROS, Babylon.js,

Ionic, Netlogo, ArGoS, Webots

Databases: Firebase, SQL

OS: Linux, Windows, Mac

## AWARDS

ADC Fellowship

Datafest "Best in Show"

## LANGUAGES

English (fluent)

Spanish (intermediate)

Korean (basic)

## **Macalester College, St. Paul — *Summer Researcher***

MAY 2019 - AUG 2019

Implemented two convolutional neural networks (with ultimate validation accuracy of 95% and 97% respectively) and optimized Monte Carlo localization-based code base to facilitate indoor robot localization and navigation

HONORS PROJECT: Digital Commons Macalester College, 2020. URL: [https://digitalcommons.macalester.edu/mathcs\\_honors/49/](https://digitalcommons.macalester.edu/mathcs_honors/49/)

## **PROJECTS**

### **Prototyping a Robotics Kit for Middle School Students — *ongoing***

Created a prototype robot equipped with a raspberry pi-based framework and basic motion and sensing functionalities that are compatible with ROS. Ultimate intent is to make user-friendly manual with guided activity to introduce middle school students to hands-on programming

### **Designing a Multi-User Interface in Virtual Reality — *ongoing***

Using Babylon.js and Matrix, a multi-user interface was configured that would encourage multiple users to interact across different Oculus headsets.

Github: [https://github.com/mill7079/final\\_CSCI5619](https://github.com/mill7079/final_CSCI5619)

### **MacStudyAway—**

Coordinated with Macalester Center for Study Away to create a UX-friendly, tinder-inspired interface for study abroad program recommendations with a forum/timeline feature

Github: <https://github.com/dnguyen2021/MacAbroad>

## **ADDITIONAL EXPERIENCE**

### **University of Minnesota —**

Graduate Teaching Assistant for CSCI 1133 (Python, 1 year), 1103 (Java, 1 semester), 1933 (Java, 1 year) and CSCI 2980

Summer Computing Camp Instructor (Python, Jun 2022)

### **Macalester —**

Preceptor for COMP123 (Python, 1.5 years)

## PUBLICATIONS/WORKSHOP PAPERS

1. A. Sylvester, M. Gini. "Facilitating Real-time Collaboration and Learning in Search Environments for Multi-Robot Systems via Real-time Evolutionary Algorithm". In: ARMS, Workshop at AAMAS 2023.
2. J. Harwell, A. Sylvester, M. Gini. "Characterizing the Limits of Linear Modeling of Non-linear Swarm Behaviors". In: Autonomous Robots (2022).
3. J. Harwell, A. Sylvester, M. Gini. "A Robust Model for Predicting Collective Behavior in Large Robot Swarms". In: Robotics swarms in the real world, Workshop at ICRA, 2021.

## PRESENTATIONS/POSTER SESSIONS

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|------|---|
| 2023 | Developing a Patient-centered Solution by Addressing Technology Accessibility, ICRA Ethics Challenge                    |
| 2023 | A Dynamic Biology Driven Evolutionary Solution to Emergent Precursors to Optimal Behavior, <i>CRA-WP Workshop</i>       |
| 2023 | Enforcing Real-time Collaboration and Learning in Search Environments for Multi-Robot Systems, <i>MSI RC Exhibition</i> |
| 2022 | Exploring the Role of Classroom Composition on Student Performance, <i>SEISMIC Minnesota Week Exhibition</i>            |