

Areas of Interest: Natural Language Processing, Computer Vision, Regression

EDUCATION

University of Illinois at Urbana-Champaign **2023**
Master of Science in Computer Science **GPA: 4.0/4.0**
Advisor: Nancy M. Amato

University of Illinois at Urbana-Champaign **2019**
Bachelor of Science in Computer Science (with Honors) **GPA: 3.8/4.0**

AWARDS

- **Fellowships/Scholarships:** NSF Graduate Research Fellowship (2021), GEM Fellowship (2020), Saburo Muroga Endowed Fellowship (2019), Engineering Pathways Scholarship (2016-2019), Hispanic Scholarship Fund (2018-2020), Carol Stream Community College Scholarship (2016), S.C. Reed Scholarship (2016), H.J. Kleemann Scholarship (2015), Rotary Club of Naperville Scholarship (2015)
- **Recognitions:** Ford Fellowship (Honorable Mention) (2021), Phi Kappa Phi (2021), C. S. Larson Transfer Student Award and Scholarship (2019), Tau Beta Pi (2018), College of DuPage Student Spotlight (2016)

RELEVANT EXPERIENCE

University of Illinois at Urbana-Champaign - Parasol Lab **Urbana, IL**
NSF Graduate Research Fellowship - Advisor: Nancy M. Amato **2019 - 2023**

- Developed novel convolutional and fully connected neural networks for spatial regression on maps, contributing to a 5X runtime improvement in multi-agent motion planning in a publication with Google Brain researchers and to an algorithm that mitigates close encounters among agents
- Customized open-source multi-agent simulators and real-home datasets to create an open-source project that advances the field of indoor multi-agent navigation simulation and analysis
- Contributed to a self-supervised learning framework that autonomously generates training data for spatial predictors, such as pedestrian motion and proximity costs, enabling the development of learned heuristics and representations that enhance navigation

Uber Technologies - Search Team **San Francisco, CA**
Software and ML Engineering - Manager: Girish Baliga **June 2023 - August 2023**

- Led the development and optimization of XGBoost and deep neural networks for ETA prediction in driver-rider matching, with a focus on low-latency, compact model size, and high-quality candidate ranking
- Conducted ablation and feasibility studies on multiple models and devised a custom evaluation framework using accuracy metrics and Spearman rank correlation to assess both regression and ranking performance

Stanford University - Hazy Research Lab **Stanford, CA**
Research - Advisor: Christopher Ré **2018 - 2019**

- Collaborated with Alex Ratner (now CEO of Snorkel AI) on extending Snorkel, a system for rapidly creating, modeling, and managing training data, for multi-sentence weak supervision in NLP via LSTMs
- Adapted baseline heuristics for single-sentence extraction, and achieved a 12% F1 score improvement using novel multi-sentence strategies and multi-task learning

University of Illinois at Urbana-Champaign - IL Geometry Lab
Research - Advisor: Richard Sowers

Urbana, IL
2018

- Enhanced the 'Video As a Sensor' system by integrating scene detection and object tracking functionalities, contributing to a system that quantifies roadway risks through human behavior analysis
- Developed an object tracking model and leveraged weak supervision to accelerate classifier creation and improve performance, utilizing computer vision and spatial heuristics like pose and cross-temporal analysis

University of California Berkeley - BETS Lab
Research - Advisor: David Culler

Berkeley, CA
June 2017 - August 2017

- Collaborated with a Ph.D. candidate on E-mission, the first open-source mobilityscope platform, to enhance its incident reporting capabilities during the tracking of multi-modal transportation
- Engineered a shake gesture detection baseline using signal processing techniques for imbalanced binary classification and improved F1 scores by 7% through Support Vector Machine integration

PUBLICATIONS

- **Pedestrian Motion Pattern Prediction for Social Navigation via Self-Supervision**
F. F. Arias, M. Morales, N. M. Amato
Social Intelligence in Humans and Robots Workshop, Robotics: Science and Systems (RSS), New York City, June 2022.
- **Pedestrian Motion Pattern Prediction from Traversability Maps**
F. F. Arias, M. Morales, N. M. Amato
Scaling Robot Learning Workshop, IEEE International Conference on Robotics and Automation, Philadelphia, May 2022.
- **Avoidance Critical Probabilistic Roadmaps for Motion Planning in Dynamic Environments**
F. F. Arias, B. Ichter, A. Faust, and N. M. Amato, "Avoidance critical probabilistic roadmaps for motion planning in dynamic environments," in Proc. IEEE Int. Conf. Robot. Automat., 2021, pp. 10264–10270

SKILLS

- **Programming:** Python, C++, Tensorflow, Pytorch, ROS, Gazebo, L^AT_EX
- **Version Control:** Git **Operating Systems:** Linux, OS X
- **Languages:** English (fluent), Spanish (fluent)

PROFESSIONAL ACTIVITIES

Conferences and Workshops

- International Conference on Robotics and Automation (Xi'an, China 2021, Philadelphia, PA 2022), Robotics: Science and Systems (New York, NY 2022), Richard Tapia Conference (Washington DC 2022), IEEE RAS Summer School on Multi-Robot Systems (Prague, Czech Republic 2022), CRA-WP Grad Cohort Workshop for IDEALS (Austin, TX 2019, San Diego, CA 2022)

Affiliations

- Google CS Research Mentorship Program (2021, Mentor: Jie Tan), GEM Consortium (2020), Diversifying Future Leadership in the Professoriate Alliance (2020-Present), Society of Hispanic Professional Engineers (2018-Present), The Leadership Alliance (2018), Tau Beta Pi (2018-2019), Morrill Engineering Program (2016-2018), Engineering Pathways (2014-2018)