# Felipe Felix Arias

felipefelixarias.github.io

felipefelixarias@gmail.com


**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** **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** **Urbana, IL**
**Research - Advisor: Richard Sowers** **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** **Berkeley, CA**
**Research - Advisor: David Culler** **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, LaTeX
- **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)