INGRID NAVARRO-ANAYA

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PhD Student in Robotics at The Robotics Institute, Carnegie Mellon University (CMU)

EDUCATION

- Ph.D. in Robotics — *Carnegie Mellon University, USA* — Aug 2022 — Aug 2028
- M.S. in Robotics — *Carnegie Mellon University, USA* — Aug 2020 — Aug 2022
- B.S. in Computer Engineering — *Tecnológico de Monterrey, México* — Aug 2014 — May 2019
  - Study Abroad — *École Polytechnique de Montréal, Canada* — Aug 2017 — Dec 2017

RESEARCH EXPERIENCE

Graduate Researcher — *Bot Intelligence Group (BIG), CMU* — Aug 2020 – Present

Advised by: Jean Oh and Sebastian Scherer

Exploring methodologies for improving the robustness and safe-awareness of motion prediction and navigation in human-centered environments.

Robotics Institute Summer Scholar (RISS) — *Navigation Laboratory (Navlab), CMU* — Summer 2018

Advised by: Luis Ernesto Navarro-Serment

Learning-based algorithms for semantic segmentation of sparse 3D point clouds from low-end LiDAR sensors.

Robotics Institute Summer Scholar (RISS) — *Navigation Lab (Navlab), CMU* — Summer 2017

Advised by: Luis Ernesto Navarro-Serment

Design of a dataset and deep learning algorithms for wheelchair detection in cluttered environments.

Undergraduate Researcher — *Autonomous Vehicles Lab (Vanttec), Tecnologico de Monterrey* — Aug 2017 – Aug 2018

Advised by: Leonardo Garrido-Luna

Learning-based algorithms for obstacle detection and navigation on aquatic surfaces.

SERVICE

- Robotics Institute Summer Scholars (RISS) program mentor — *CMU* — 2021, 2023
- Admissions committee member for the RISS program — *CMU* — 2021, 2022, 2024
- Chair of Finances for the Latino Graduate Student Association (LGSA) — *CMU* — 2023
- Committee member for the Learn-to-Race workshop at IJCAI — *CMU* — 2022

PEER REVIEWING

International Conference on Robotics and Automation (ICRA) | International Conference on Intelligent Robots and Systems (IROS) | Human Robot Interaction (HRI)

WORK EXPERIENCE

Robotics Software Engineer — *Stealth Mode Medical Robotics Startup* — Jan 2020 – Aug 2020

Advised by: Kamran Shamaei and Alfonso Paltán

Built and integrated algorithms for collision detection and avoidance for a surgical implant robot manipulator.

Computer Vision Engineer — *X-LAB Protexa R&D* — Nov 2019 – Jul 2020

Design of a dataset and learning-based visual inspection method for detecting and categorizing vehicle paint defects.

Computer Vision Intern — *Carbon Robotics* — Jul 2019 – Sep 2019

Advised by: Kamran Shamaei and Alfonso Paltán

Design of a camera calibration evaluation scheme using an OptiTrack motion capture system and plane fitting techniques.

TEACHING

Teaching Assistant, 16-720 Computer Vision — *CMU* — Spring 2023

Instructor: Deva Ramanan

Teaching Assistant, 16-785 Integrated Intelligence in Robotics: Vision-Language Planning — *CMU* — Spring 2024

Instructor: Jean Oh

MENTORING

Pablo Ortega-Kral — *RISS Scholar, CMU* — Jun 2023 - Dec 2023

Project: Design of a real-world dataset, method for motion prediction, and evaluation tools for scenario risk analysis in airport surface operations.

Jong Hoon Park — *M.S. Student in Mechanical Engineering, CMU* — Jun 2023 - Aug 2023

Project: Explore self-supervised techniques to improve the adaptability of motion prediction models to unseen environments.

Shaunak Halbe — *RISS Student, CMU* — Jun 2021 - Dec 2021

Project: Designing hierarchical policies for improved interpretability in Vision-and-Language Navigation.

PUBLICATIONS

THESIS

Ingrid Navarro. ***Socially-Aware Trajectory Prediction Guided by Motion Patterns.*** Carnegie Mellon University. CMU-RI-TR-22-38. (2022) [ ]

JOURNAL ARTICLES

Jonathan Francis*, Nariaki Kitamura*, Felix Labelle*, Xiaopeng Lu*, Ingrid Navarro* and Jean Oh. ***Core Challenges in Embodied Vision-Language Planning.*** Journal of Artificial Intelligence (JAIR). Vol. 74. (2022) *Equal contribution; alphabetically ordered. [ ]

Ingrid Navarro*, Jay Patrikar*, Joao P. A. Dantas, Rohan Baijal, Ian Higgins, Sebastian Scherer and Jean Oh. ***SoRTS: Learned Tree Search for Long-Horizon Social Robot Navigation.*** IEEE Robotics and Automation Letters (RA-L). Vol. 9, Issue 4, pp. 3759-3766. (2024) *Equal contribution. [| |]

PROCEEDINGS

Ingrid Navarro and Jean Oh. ***Social-PatteRNN: Socially-aware Trajectory Prediction Guided by Motion Patterns.*** In IEEE International Conference on Intelligent Robots and Systems (IROS). pp. 9859–9864. (2022) [|]

Ingrid Navarro, Alberto Herrera, Itzel Hernandez and Leonardo Garrido. ***Data Augmentation in Deep Learning-based Obstacle Detection for Autonomous Navigation on Aquatic Surfaces.*** In 17th Mexican International Conference on Artificial Intelligence, (MICAI). Lecture Notes in Artificial Intelligence. (2018) [|]

WORKSHOP/WORKING PAPERS

Pablo Ortega-Kral, Ingrid Navarro and Jean Oh. ***Cleared-for-Takeoff: Motion Prediction in Airports using Heterogeneous Map Representations.*** Robotics Institute Summer Scholars (RISS). Working Papers Journal, Vol. 11. (2023) [ ]

Jay Patrikar, Joao Dantas, Sourish Ghosh, Parv Kapoor, Ian Higgins, Jasmine J. Aloor, Ingrid Navarro, Jimin Sun, Ben Stoler, Milad Hamidi, Rohan Baijal, Brady Moon, Jean Oh and Sebastian Scherer. ***Challenges in Close-Proximity Safe and Seamless Operation of Manned and Unmanned Aircraft in Shared Airspace.*** IEEE International Conference on Robotics and Automation (ICRA). Aerial Robotics Workshop. (2022) [ ]

Shaunak Halbe, Ingrid Navarro and Jean Oh. ***Reason & Act: A Modular Approach to Explanation-Driven Agents for Vision-and-Language Navigation.*** Robotics Institute Summer Scholars (RISS). Working Papers Journal, Vol. 9. (2021) [ ]

Ingrid Navarro and Luis E. Navarro-Serment. ***Real-Time Semantic Segmentation System of Sparse LiDAR Point Clouds using Lightweight CNNs and Recurrent CRF.*** Robotics Institute Summer Scholars (RISS). Working Papers Journal, Vol. 6. (2018) [|]

Ingrid Navarro and Luis E. Navarro-Serment. ***A Faster RCNN-Based Wheelchair Recognition System.*** Robotics Institute Summer Scholars (RISS). Working Papers Journal, Vol. 5. (2017) [ ]

PRE-PRINTS

Benjamin Stoler*, Ingrid Navarro*, Soonmin Hwang, Jonathan Francis and Jean Oh. ***SafeShift: Safety-Informed Distribution Shifts for Robust Trajectory.*** ArXiv. v2 . (2024) *Equal contribution; Under review for publication in IEEE Intelligent Vehicles Symposium [|]

Gyan Tatiya, Jonathan Francis, Luca Bondi, Ingrid Navarro, Eric Nyberg, Jivko Sinapov, and Jean Oh. ***Knowledge-driven Scene Priors for Semantic Audio-Visual Embodied Navigation.*** ArXiv. v1. (2022) [🔗]

PRESS

- AI Pilot Can Navigate Crowded Airspace — *School of Computer Science, CMU* 🔗 — Aug 2022
- Move over, autopilot: This AI can avoid other planes — *Popular Science* 🔗 — Aug 2022
- CMU's AI pilot lands in the news — *Practical AI Podcast* 🔗 — Aug 2022
- Researchers Develop AI Pilot for Navigating Crowded Airspace — *Avionics International* 🔗 — Aug 2022

HONORS / AWARDS

- Top student of the Department of Engineering — *Tecnológico de Monterrey* — Apr 2018
- RoboCup Platform Soccer League Competition, 1st place. — *Mexican Robotics Tournament* — May 2018
- Emerging Leaders in the Americas Program (ELAP) Scholarship Recipient — *Government of Canada* — Aug 2017
- Scholarship recipient — *Santander - Tecnológico de Monterrey* — May 2017
- Hackathon MTY, Junior Category, 1st Place — *Major League Hacking* — Mar 2016

LANGUAGES

Spanish (Native) | French (Fluent) | English (Fluent)