INGRID NAVARRO

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Robotics Graduate Student at Carnegie Mellon University

EDUCATION

M.S. in Robotics — *Carnegie Mellon University* — Aug 2020 – present

Coursework: Math for Robotics (16-811), Computer Vision (16-720), Statistical Techniques for Robotics (16-831), Kinematics, Dynamics and Control (16-711)

B.S. in Computer Engineering — *Tecnológico de Monterrey* — Aug 2014 – May 2019

Exchange Student in Computer Engineering — *École Polytechnique de Montréal* — Aug 2017 – Dec 2017

SERVICE

Admissions Committee for the RISS program — *Carnegie Mellon University* — January 2021

RESEARCH EXPERIENCE

Graduate Researcher — *Bot Intelligence Group (BIG) at Carnegie Mellon University* — Aug 2020 – Present

Working on *Embodied AI* tasks that require multi-modal reasoning to complete goals.

Undergraduate Research Intern — *Navlab at Carnegie Mellon University* — Jun 2018 – Aug 2018

Worked on semantic segmentation of 3D point clouds from low-end sensors using computer vision and plane-fitting methods.

Undergraduate Research Intern — *Navlab at Carnegie Mellon University* — June 2017 – August 2017

Worked on wheelchair detection and tracking in cluttered environments using deep learning-based computer vision methods.

RESEARCH INTERESTS

Robotics | Embodied AI | Reinforcement Learning | Deep Learning | Computer Vision | Planning

WORK EXPERIENCE

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

Designed algorithms and simulations to build collision detection framework for a surgical robot manipulator.

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

- **Project 1**: Designed a prototype of a visual inspection system to detect paint defects on vehicles.
- **Project 2**: Designed a prototype of a visual navigation stack for an autonomous mobile robot.

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

Designed a scheme to evaluate the accuracy of a camera calibration system using an motion capture system and plane fitting methods.

RELEVANT PROJECTS

Reward Learning in Navigation — *Carnegie Mellon University* — Dec 2020

Final project for 16-811 Math fundamentals for robotics
Implemented Reinforcement Learning algorithms to train agents to navigate in indoor environments.

Home Service Robot — *Robotics Software Engineer Udacity Nanodegree* — Apr 2020

Used ROS to simulate a home service robot which uses SLAM and path planning to navigate and move objects from room to room.

Perception System of Autonomous Boat — *Tecnológico de Monterrey* — Jan 2018 – May 2019

Final project for IA-95012 Intelligent Systems
Worked on the design of the perception stack for an autonomous boat that had to navigate through multiple obstacle courses.

PUBLICATIONS

Papers

- Francis, Jonathan*, Nariaki Kitamura*, Felix Labelle*, Xiaopeng Lu*, **Ingrid Navarro***, and Jean Oh* (2021). *Core Challenges in Embodied Vision-Language Planning*. arXiv: 2106.13948 [cs.LG].

Conference Proceedings

- **Ingrid Navarro**, Alberto Herrera, Itzel Hernandez, and Leonardo Garrido (2018). "Data Augmentation in Deep Learning-based Obstacle Detection for Autonomous Navigation on Aquatic Surfaces". In: *Advances in Computational Intelligence. 17th Mexican International Conference on Artificial Intelligence, MICAI 2018, Guadalajara, Mexico, Proceedings, Part II*. vol. 11289. Springer International Publishing, pp. 342–353.

Poster Presentations

- **Ingrid Navarro** and Luis Ernesto Navarro-Serment (2018). "Real-Time Semantic Segmentation System of Sparse LiDAR Point Clouds using Lightweight CNNs and Recurrent CRF". in: *RISS Working Papers Journal* Vol. 6, pp. 105–111.
- **Ingrid Navarro** and Luis E. Navarro-Serment (2017). "A Faster RCNN-Based Wheelchair Recognition System". In: *RISS Working Papers Journal* Vol. 5, pp. 125–132.

CERTIFICATIONS

Robotics Software Engineer — *Udacity Nanodegree* — Apr 2020

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

SKILLS

C++ | Python | Pytorch | Habitat AI | ROS | OpenCV | VTK | Protobuf | OpenRAVE | Git | Bitbucket | Jira | Ubuntu | Windows

LANGUAGES

Spanish | French | English