Miguel Saavedra-Ruiz

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Education

M.Sc. Computer Science — Montreal, Canada
Université de Montréal; GPA: 4.3/4.3 — Sep 2021 - Ongoing
Advisor: Liam Paull
Scholarship awarded by DIRO and Le ministère de l'Enseignement supérieur du Québec: 4.000 CAD.

PGDip. Artificial Intelligence — Cali, Colombia
Universidad Autonoma de Occidente; GPA: 4.9/5.0 — Aug 2020 - Jun 2021

B.Eng. Mechatronics Engineering — Cali, Colombia
Universidad Autonoma de Occidente; GPA: 4.7/5.0 — Jan 2014 - Apr 2019
Thesis: "Autonomous landing system for an unmanned aerial vehicle on a terrestrial vehicle"
Advisor: Victor Romero-Cano
Decoration: Highest GPA of engineering faculty and graduate position number one.
Academic Excellence Award: Covered 100% tuition cost. Nine Academic periods.
Academic Excellence Scholarship: Covered 80% tuition cost for the whole undergraduate program.

Research Interest

Application of Artificial Intelligence in embodied Agents, Self-Supervised Representation Learning, Robot Navigation, Computer vision, SLAM, Graphical Models, Uncertainty Estimation, Reinforcement Learning.

Experience

Mila - Quebec AI Institute — Montreal, Canada
Masters Candidate - Student Researcher — Sep 2021 - Ongoing

- Research within the intersection of AI and robotics, Self-Supervised Representation Learning for embodied agents, Learning-based mobile robot navigation and Uncertainty estimation in Deep Learning.

Whale & Jaguar — Cali, Colombia
Machine Learning Engineer — Dec 2020 - Jul 2021

- Research and development of Machine Learning algorithms for social media analysis (Natural Language Processing).

AirflyD & Romero Cano Ingeniería — Cali, Colombia
R&D Robotics Software Engineer — Jan 2020 - Sep 2020

- Research and development of a flight stack and vision application for a heavy-cargo hexacopter with internal combustion engines for precision agriculture applications.

CRT Ingeniería S.A.S. & Romero Cano Ingeniería — Cali, Colombia
Lead Developer — Jan 2019 - Dec 2019

- Developed, tested and implemented software solutions for security applications using deep neural networks and computer vision techniques. Some of the achievements where an AI-based license plate recognition system, image-based heat maps for crowd flow estimation and floor segmentation.

Universidad Autónoma de Occidente Cali, Colombia
Member of the Hotbed of Robotics & Autonomous Systems (RAS) Jul 2017 - Apr 2019

– Developed, tested and implemented different projects as member of RAS. Most of the projects were research initiatives of the university and were presented in local conferences.

- 3D object detector for vehicles using classic Machine Learning
- Simulation of a landing system for a UAV in Gazebo
- Teleoperation system for a car-like robot (inverse kinematics)
- Object detection and recognition using Convolutional Neural Networks
- Autonomous landing system for an unmanned aerial vehicle on a terrestrial vehicle
- Detection and tracking of a landing platform for aerial robotics applications
- Mapping and localization in indoors with Turtlebot 2

Publications

[1] **Saavedra-Ruiz, Miguel**, S. Morin, and L. Paull, "Monocular robot navigation with self-supervised pretrained vision transformers", *In proceeding of the 19th Conference on Robots and Vision (To appear)*, 2022.

[2] **Saavedra-Ruiz, Miguel**, A. M. Pinto-Vargas, and V. Romero-Cano, "Monocular visual autonomous landing system for quadcopter drones using software in the loop", *IEEE Aerospace and Electronic Systems Magazine*, vol. 37, no. 5, pp. 2–16, 2022.

[3] G. A. Salazar-Gomez, **Miguel Saavedra-Ruiz**, and V. Romero-Cano, "High-level camera-lidar fusion for 3d object detection with machine learning", *LatinX Workshop at CVPR 2021 (Poster Presentation)*, 2022.

[4] **Ruiz, Miguel Saavedra**, A. M. P. Vargas, and V. R. Cano, "Detection and tracking of a landing platform for aerial robotics applications", in *2018 IEEE 2nd Colombian Conference on Robotics and Automation (CCRA)*, 2018, pp. 1–6.

Relevant Courses & Certificates

- **CIFAR DLRL Summer School** July 29, 2022
  CIFAR partnered with Amii, Mila & Vector Institute
  Deep Learning, Reinforcement Learning, Optimization, Causal Inference and Scaling Laws.
- **ETH Robotics Summer School** July 8, 2022
  The RobotX initiative & ETH Zürich.
  Control, State Estimation, SLAM, Path planning and Perception + Search and rescue challenge.
- **Reinforcement Learning MOOC** June 21, 2020
  University of Alberta & Alberta Machine Intelligence Institute on Coursera.
  Policy gradient, TD methods, Actor-Critic, Value and Policy iteration.
- **Self-Driving Cars MOOC** June 5, 2019
  University of Toronto on Coursera, a 4-course specialization.
  Visual Perception, Math modelling, State Estimation and Motion Planning.

Skills

- **Languages:** Python, C, C++, Matlab, HTML, SQL, Shell, LaTeX
- **Libraries:** OpenCV, PyTorch, Scikit-Learn, OpenAI Gym, ROS, PCL
- **Technologies:** Gazebo, Docker, GitHub

Languages

- **English:** Fluent
  – **IELTS Academic:** 7.5 Overall
- **Spanish:** Mother-tongue
- **French:** Basic