Miguel Saavedra-Ruiz

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Education

M.Sc. Computer Science Montreal, Canada
Université de Montréal Sep 2021 - Ongoing
Advisor: Liam Paull

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; Graduate position number one. Jan 2014 - Apr 2019
Thesis: "Autonomous landing system for an unmanned aerial vehicle on a terrestrial vehicle"
Advisor: Victor Romero-Cano
Academic Excellence Award: Covered 100% tuition cost. Nine Academic periods.
Academic Excellence Scholarship: Covered 80% tuition cost for the whole undergraduate program.

Research Interest

Artificial Intelligence for Robotic Agents, Self-Supervised Representation Learning, Computer vision, SLAM, Graphical Models, Uncertainty Estimation, Reinforcement Learning, Graphical models.

Experience

Quebec Artificial Intelligence Institute Montreal, Canada
Masters Candidate - Student Researcher Sep 2021 - Ongoing

− Research within the intersection of AI and robotics, Uncertainty estimation in Deep Learning and Self-Supervised Representation 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 - Ongoing

– 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] M. Saavedra-Ruiz, 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*, pp. 1–1, 2021.

[2] M. S. Ruiz, 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.

PROJECTS

List of projects developed to learn a new algorithm, computational tool or as a research initiative.

- Visual-based pose estimation in a quad-rotor VO and VIO pipelines for pose estimation.
- Reinforcement Learning Specialization Projects Semi-gradient and actor-critic algorithms.
- Robotics Software Engineer projects SLAM, Navigation and Planning.
- Self-Driving Cars Specialization Projects Visual perception, Math modelling, State estimation.

RELEVANT COURSES & CERTIFICATES

- **Reinforcement Learning** June 21, 2020
  University of Alberta & Alberta Machine Intelligence Institute on Coursera.
- **Self-Driving Cars** June 5, 2019
  University of Toronto on Coursera, a 4-course specialization.

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