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 applied to Robotics, Machine Learning, Reinforcement Learning, Machine Vision, Computer vision, SLAM and 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 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