

Rodrigo Lopes Catto

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EDUCATION

Carnegie Mellon University

Master of Science in Robotic Systems Development | GPA: 3.92/4.00

Coursework: Localization & Mapping, Computer Vision, Robot Autonomy.

Pittsburgh, PA

May 2026

Inspire - Institute of Education and Research

Bachelor of Science in Mechatronic Engineering | GPA: 8.42/10.0

Coursework: Intelligent Systems, Machine Vision, Modern Control, Industrial Robotics

São Paulo, Brazil

Dec 2019

SKILLS

Programming Languages: Python, C/C++, SQL, MATLAB, PLC programming (Rockwell), and Excel VBA.

Software: ROS1, ROS2, Git, Gazebo Sim, Rviz, Linux, Docker, Jira, TensorFlow, CAD (Fusion360 and SolidWorks), Arduino IDE, Raspberry Pi, Jetson Boards, and PCB Design (Eagle).

Fabrication: CNC machining (milling and turning), 3D Printing, CAM, and laser cutting.

EMPLOYMENT HISTORY

Moray AI / Spacetime Labs [\[U.S. Patent 12207582\]](#)

Robotics Engineer

São Paulo, Brazil

Dec 2021 - Aug 2024

- Led the software and hardware integration for autonomous agricultural robot solutions from ground to a minimum viable product with a team of 5 members in under 8 months.
- Conducted trade studies for the software architecture and all the perception and navigation sensors to enable centimetric precision for crop row navigation, including GNSS, RTK, IMU, Depth Cameras, embedded Nvidia Jetson computers, and other components.
- Designed and implemented the initial navigation pipeline using Kalman Filter, RANSAC plane estimation, feature extraction, filtering, and sensor fusion, optimizing trajectory planning and cost map tuning for precise row-following with Nav2 Model Predictive Path Integral Controller.
- Developed software using ROS2 with Python and C++ combined with Docker for scalability, following and implementing team-wise best practices.
- Adapted and field-tested ROS software for a modification on a Clearpath Warthog to use an inverted U-cage enabling navigation in the middle of several crops (soybean, cotton, and corn) maintaining its original centimetric navigation precision.

GIC

Robotics Developer

São Paulo, Brazil

Jun 2021 - Dec 2021

- Improved the architecture, integration, and testing processes of autonomous robots in retail stores, enabling more in-store testing and accelerating improvement cycles from once per semester to every two months.
- Upgraded the SLAM stack with newer methods and packages enabling mapping areas bigger than 25,000 sqft.
- Used computer vision and ArUco markers to position the robots during docking and undocking operations.
- Developed using ROS packages with sensor fusion, SLAM, autonomous navigation, state machines, embedded programming, and web servers.

Mvisia

Jr. Computer Vision Developer

São Paulo, Brazil

Dec 2020 - Jun 2021

- Applied classic and modern computer vision techniques with AI using TensorFlow and OpenCV for industrial applications in real-time embedded systems.

PROJECTS

Autonomous Food Manipulation Kiosk | CMU

Sep 2024 - Present

- Developing an automated kiosk for reliable, consistent sandwich assembly using a Franka Emika robotic arm with suction grippers to enhance quick-service food preparation.

Assistant at the AI Makerspace | CMU

Sep 2024 - Present

- Developed and integrated Misty Robots API into ROS2 packages.
- Deployed and calibrated a RealSense L515 ceiling-mounted camera to track multiple Misty Robots within an arena using ArUco markers, publishing real-time data in ROS2.
- Implemented autonomous navigation using the Nav2 package for Misty Robots, enabling object avoidance through depth information from the RealSense L515.

Self-Driving Car Engineer | Udacity Online Course

Jun 2020 - Dec 2020

- Built convolutional neural networks (CNNs) with TensorFlow for traffic light, lane, and vehicle detection.
- Conducted camera calibration and distortion correction, and implemented image rectification for bird's-eye-view transformations.

Research Scholarship | Inspire

Aug 2018 - Aug 2019

- Designed an autonomous RC car using ROS to navigate predefined points while avoiding obstacles in open fields, utilizing a Jetson Nano with Python, C++, Linux, and ROS navigation stack.
- Calibrated robot odometry using the UMBmark method, improving sensor fusion and enhancing localization accuracy.