

Raul Steinmetz - Curriculum Vitae

DOB: 2003/08/08 **Nationality:** Brazilian, Italian **Address:** Tsukuba, Japan
E-mail: raulsteinmetz08@gmail.com **Website:** <https://raulsteinmetz.github.io/>

ABOUT

I am a Master's student in Computer Science at the University of Tsukuba, with over four years of research experience in machine learning and robotics. My work focuses on deep learning for computer vision and deep reinforcement learning for robotics control.

EMPLOYMENT HISTORY

Qiron Robotics, Brazil – Sep. 2022 - Feb. 2023

Internship

Developed a conversational interface (GPT-based) and a face recognition algorithm for a humanoid robot, using ROS2, OpenCV and OpenAI and Google APIs.

EDUCATION HISTORY

M.S. Computer Science, University of Tsukuba, Japan – Apr. 2025 - **ongoing** (until Mar. 2027)

Current GPA: 3.0/3.0 (Monbukagakusho scholarship calculation)

Advisor: Ohya Akihisa (PhD)

Remark - From Dec. 2024 to Apr. 2025 I was waiting for the start of my Master's at the University of Tsukuba. I was accepted into the Master's program in Nov. 2024, and spent the gap preparing for my move to Japan.

B.S. Computer Science, Universidade Federal de Santa Maria, Brazil – May. 2021 - Dec. 2024

Thesis: "World Models for Autonomous Navigation of Terrestrial Robots from LIDAR Observations"

Grade Average: 9.26/10.0

Advisor: Daniel Gamarra (PhD)

* Research done during this period has been cited 70+ times.

Remark - The school year in Brazil ends in mid December. From Dec. 2020 to May 2021 I was waiting for the start of my undergrad studies. The school year at the Universidade Federal de Santa Maria usually starts in March, but due to the COVID-19 pandemic, it started late (May).

High School Diploma, Colégio Murialdo de Ana Rech, Brazil – Feb. 2018 - Dec. 2020

Grade average: 9.22/10.0

* Graduated at 17 years old

COMPUTER SKILLS

Programming - Python3, C, C++

Applications - PyTorch, ROS2, Isaac Sim, Git, Docker

Platforms - Linux

LANGUAGES

Portuguese: Native Language

English: Advanced (C1)

Japanese: Elementary listening, reading, writing, speaking (currently learning)

ACTIVITIES AND INTERESTS

My interests revolve around deep learning and robotics. Following is a list of activities done in the past.

Robotics Competitions:

[1] Tsukuba Challenge 2025 - Mayor's Award

* Participated in team Kerberos (University of Tsukuba), worked in computer vision.

* Tsukuba Challenge is a major real world autonomous navigation experiment that happens once a year. The Mayor's Award is the highest distinction a team can achieve (the robot must complete the full course and extra tasks without any human intervention). **Notably, my team was the only one to achieve this award, from 79 teams present, from multiple different japanese universities** (reference: <https://tsukubachallenge.jp/2025/records/final>).

Papers published:

[1] Jair Augusto Bottega, Victor Augusto Kich, Junior Costa de Jesus, **Raul Steinmetz**, Alisson Henrique Kolling, Ricardo Bedin Grando, Rodrigo da Silva Guerra, and Daniel Fernando Tello Gamarra. Jubileo: An immersive simulation framework for social robot design. *Journal of Intelligent & Robotic Systems*, 109(4):91, 2023.

[2] Jair Augusto Bottega, **Raul Steinmetz**, Alisson Henrique Kolling, Victor Augusto Kich, Junior Costa De Jesus, Ricardo Bedin Grando, and Daniel Fernando Tello Gamarra. Virtual reality platform to develop and test applications on human-robot social interaction. In 2022 Latin American Robotics Symposium (LARS), 2022 Brazilian Symposium on Robotics (SBR), and 2022 Workshop on Robotics in Education (WRE), pages 1–6, 2022.

[3] Victor A. Kich, Jair A. Bottega, **Raul Steinmetz**, Ricardo B. Grando, Ayano Yorozu, and Akihisa Ohya. Curling the dream: Contrastive representations for world modeling in reinforcement learning. In 2024 24th International Conference on Control, Automation and Systems (ICCAS), pages 952–957, 2024.

[4] Victor A. Kich, Jair A. Bottega, **Raul Steinmetz**, Ricardo B. Grando, Ayano Yorozu, and Akihisa Ohya. Kolmogorov-arnold networks for online reinforcement learning. In 2024 24th International Conference on Control, Automation and Systems (ICCAS), pages 958–963, 2024.

[5] Joao DR Mazzarolo, **Raul Steinmetz**, and Sergio LS Mergen. Um estudo sobre a falta de padronização na descrição de produtos em notas fiscais eletrônicas. In Anais do XVII Escola Regional de Banco de Dados, pages 31–40. SBC, 2022.

[6] **Raul Steinmetz**, Fabio Demo Rosa, Victor Augusto Kich, Jair Augusto Bottega, Ricardo Bedin Grando, and Daniel Fernando Tello Gamarra. World models for autonomous navigation of terrestrial robots from lidar observations. *Journal of Intelligent & Fuzzy Systems*, page 18758967251399741, 2025.

[7] **Raul Steinmetz**, Victor Augusto Kich, Henrique Krever, João Davi Rigo Mazzarolo, Ricardo Bedin Grando, Vinicius Marini, Celio Trois, and Ard Nieuwenhuizen. From seedling to harvest: The growingsoy dataset for weed detection in soy crops via instance segmentation. In 2024 IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and IEEE International Conference on Robotics, Automation and Mechatronics (RAM), pages 502–507, 2024.

Reviewed papers for:

[1] IEEE Robotics and Automation Letters (2025)

[2] IEEE ICRA 2025

[3] Knowledge-Based Systems (2025)

[4] Results in Engineering (2025)

[5] IEEE CIS-RAM 2024

Workshops (taught):

[1] Machine Learning - 2022, Universidade Federal de Santa Maria, aimed at new undergraduate students

[2] Git and GitHub - 2022, Universidade Federal de Santa Maria, aimed at new undergraduate students

[3] Java - 2022, Universidade Federal de Santa Maria, aimed at new undergraduate students

[4] LaTeX Overleaf - 2022, online, aimed at Public School Teachers (250+ attendees)

Awards:

[1] Monbukagakusho Scholarship, University of Tsukuba (Apr. 2025 - Mar. 2027) – for pursuing my master's degree

[2] CNPq Scholarship (Brazilian Government), Universidade Federal de Santa Maria (Sep. 2023 - Aug. 2024) - for researching on machine learning and robotics as an undergraduate

[3] CNPq Scholarship (Brazilian Government), Universidade Federal de Santa Maria (Mar. 2023 - Jul. 2023) - for researching on computer vision for agriculture as an undergraduate

[4] PET Scholarship (Brazilian Government), Universidade Federal de Santa Maria (Dec. 2021 - Aug. 2022) - for supporting peer learning, teaching workshops for new students and conducting research as an undergraduate

REFERENCES

Akihisa Ohya, Ph.D. (University of Tsukuba)

Master's degree supervisor

ohya@cs.tsukuba.ac.jp

Celio Trois, Ph.D. (Universidade Federal de Santa Maria)

Professor and Research Project Manager at Federal University of Santa Maria

trois@inf.ufsm.br