Mateo Guaman Castro

Contact Information

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Education

University of Washington Sep. 2023 –
Ph.D. in Computer Science and Engineering
Advisors: Prof. Byron Boots and Prof. Abhishek Gupta

Carnegie Mellon University Aug. 2021 – Aug. 2023
M.S. in Robotics
Advisor: Prof. Sebastian Scherer
GPA: 4.04/4.00

Tufts University Sep. 2016 – May 2020
B.S. in Electrical Engineering
GPA: 3.80/4.00

Research Experience

Robotics Institute (Carnegie Mellon University) Oct. 2021 – Aug. 2023
Graduate Student Researcher *Advisor: Prof. Sebastian Scherer*
Worked on self-supervised traversability costmaps for off-road robot navigation.

National University of Singapore May 2020 – Aug. 2021
Research Intern *Advisor: Prof. Guillaume Sartoretti*
Worked on sequential spatial domain decomposition using reinforcement learning.

Tufts University Jun. 2018 – Aug. 2021
Undergraduate Research Assistant, Research Staff *Advisor: Prof. Jivko Sinapov*
Worked on perception, controls, and simulation for robotic creative problem solving.

Robotics Institute (Carnegie Mellon University) May 2019 – Aug. 2019
Resarch Intern *Advisors: Profs. Howie Choset and Guillaume Sartoretti*
Worked on SLAM-based deep reinforcement learning for hexapod active perception.

Honors and Awards

GSA Conference Funding for organizing ICML workshop, CMU 2023
Summa Cum Laude, Tufts University 2020
Member of IEEE Eta Kappa Nu, Tufts University 2019 – 2020

Conference Publications

[C1] **How Does It Feel? Self-Supervised Costmap Learning for Off-Road Vehicle Traversability**
International Conference on Robotics and Automation (ICRA), 2023
M. Guaman Castro, S. Triest, W. Wang, J. M. Gregory, F. Sanchez, J. G. Rogers III, S. Scherer

[C2] **Learning Risk-Aware Costmaps via Inverse Reinforcement Learning for Off-Road Navigation**
International Conference on Robotics and Automation (ICRA), 2023
S. Triest, **M. Guaman Castro**, P. Maheshwari, M. Sivaprakasam, W. Wang, S. Scherer

[C3] **Toward Life-Long Creative Problem Solving: Using World Models for Increased Performance in Novelty Resolution**
International Conference on Computational Creativity (ICCC), 2022
E. Gizzi, W. W. Lin, **M. Guaman Castro**, E. Harvey, J. Sinapov

[C4] **A Novelty-Centric Agent Architecture for Changing Worlds**
International Conference on Autonomous Agents and MultiAgent Systems (AAMAS), 2021
F. Muhammad, V. Sarathy, G. Tatiya, S. Goel, S. Gyawali, **M. Guaman Castro**, J. Sinapov, M. Scheutz

[C5] **Creative Problem Solving by Robots Using Action Primitive Discovery**
International Conference on Development and Learning (ICDL), 2019
E. Gizzi, **M. Guaman Castro**, J. Sinapov

Workshop and Short Papers

[W1] **TartanDrive 1.5: Improving Large Multimodal Robotics Dataset Collection and Distribution**
ICRA Workshop on Pretraining for Robotics, 2023
M. Sivaprakasam, S. Triest, **M. Guaman Castro**, M. Nye, M. Maulimov, C. Ho, P. Maheshwari, W. Wang, S. Scherer

[W2] **A Framework for Creative Problem Solving Through Action Discovery**
RSS Workshop on Declarative and Neurosymbolic Representations in Robot Learning and Control, 2021
E. Gizzi, **M. Guaman Castro**, W. W. Lin, J. Sinapov

Theses

[T1] **Self-Supervised Costmap Learning for Off-Road Vehicle Traversability**
Master's Thesis, Carnegie Mellon University, 2023
M. Guaman Castro

Teaching Experience

ES 3: Introduction to Electrical Systems Fall 2018
Tufts University
Teaching Assistant with Prof. Ron Lasser.

Service

Organizer

- **LatinX in AI Workshop at ICML**, Social Chair 2023
  Organized lunch for the workshop, a reception for 50 people, and a social hike.

Community

- **CMU Robotics Institute Climate Committee**, Member 2023
  Advocated for better Ph.D. admissions process and graduate student support.
- **CMU Field Robotics Center Activities Committee**, Chair 2022 – 2023
  Organized weekly tea times for ~ 30 people, and large BBQs for 110 people.
- **CMU AI Undergraduate Mentoring Program**, Mentor 2022
- **ICLR and ICML Virtual Conferences**, Volunteer 2020
- **Tufts University ECE Student Board**, Member 2017 – 2018

Industry Experience

SharkNinja Operating LLC Jun. 2018 – Aug. 2018
Electrical Engineering Intern
Designed and assembled a testbed for STM32 ARM Cortex-M0 microcontrollers.

Skills

Programming Languages	Python, MATLAB, C/C++, Julia, HTML/CSS
Machine Learning	PyTorch, Tensorflow, JAX
Simulators	OpenAI Gym, PyBullet, Isaac Gym, Gazebo
Robotics	ROS, Field Testing
Developer Tools	Git, Docker, SLURM
Electrical	Soldering, Circuitry
Languages	Spanish (native), English (fluent)