Mateus Valverde Gasparino

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I am a Ph.D. candidate in **Computer Science** with extensive experience in robotics and machine learning. Currently, I focus on perception and learning-based algorithms for real-world robotics applications, with a particular interest in developing generalizable navigation methods that can be applied across different robotic platforms and environments. My expertise lies in making robots work effectively in the real world.

EDUCATION

Ph.D. in Computer Science
University of Illinois at Urbana Champaign
GPA: 4.0/4.0

Urbana-Champaign, IL, USA
Jan. 2025

Master's in Mechanical Engineering, specialization in robotics
University of São Paulo
GPA: 4.0/4.0

São Carlos, SP, Brazil
2019

Bachelor's in Mechatronics Engineering
University of São Paulo
GPA: 8.9/10 (Recipient of Highest GPA Award)

São Carlos, SP, Brazil
2016

EXPERIENCE

Amazon Robotics
Applied Scientist II Co-op

North Reading, MA, USA
July. 2023 – Dec. 2023

- Researched and designed solutions based on real robot data.
- Developed perception and mapping algorithms for robots in fulfillment centers.
- Developed scalable solutions with strong research components.

University of Illinois at Urbana-Champaign
Research Assistant

Champaign, IL, USA
Jan. 2020 - Now

- Researching generalizable and foundation models for robot navigation in challenging environments.
- Developed novel navigation and perception algorithms for robots in unknown unstructured environments.
- Created learning-based control for partially known and unknown dynamic systems.

EarthSense Inc.
Research Engineer Intern

Champaign, IL, USA
May. 2022 – Aug. 2022

- Developed autonomous navigation algorithms for field robots.
- Trained network models for perception systems for outdoor unstructured environments.

University of São Paulo
Master's Researcher

São Carlos, SP, Brazil
2017 - 2019

- Designed and projected systems to improve small robots' capabilities in the field.
- Designed perception algorithm for cluttered environments in real outdoor environments.

Main Publications

[1] **WayFASTER: a Self-Supervised Traversability Prediction for Increased Navigation Awareness**
Mateus V Gasparino, Arun N Sivakumar, Girish Chowdhary
IEEE International Conference on Robotics and Automation (ICRA) 2024

[2] **Fed-EC: Bandwidth-Efficient Clustering-Based Federated Learning For Autonomous Visual Robot Navigation**
Shreya Gummadi, **Mateus V Gasparino**, Deepak Vasisht, Girish Chowdhary
IEEE Robotics and Automation Letters (RA-L) 2024

[3] **Demonstrating CropFollow++: Robust Under-Canopy Navigation with Keypoints**
Arun N Sivakumar, **Mateus V Gasparino**, Michael McGuire, Vitor A H Higuti, M. Ugur Akcal, Girish Chowdhary
Robotics: Science and Systems (RSS) 2024

[4] **W-RIZZ: A Weakly-Supervised Framework for Relative Traversability Estimation in Mobile Robotics**
Andre Schreiber, Arun N Sivakumar, Peter Du, **Mateus V Gasparino**, Girish Chowdhary, Katherine Driggs-Campbell
IEEE Robotics and Automation Letters (RA-L) 2024

[5] **Unmatched uncertainty mitigation through neural network supported model predictive control**
Mateus V Gasparino, Prabhat K Mishra, Girish Chowdhary
IEEE Conference on Decision and Control (CDC) 2023

[6] **Cropnav: a framework for autonomous navigation in real farms.**
Mateus V Gasparino, Vitor A H Higuti, Arun N Sivakumar, Andres E B Velasquez, Marcelo Becker, Girish Chowdhary
2023 IEEE International Conference on Robotics and Automation (ICRA) 2023

[7] **WayFAST: Navigation with predictive traversability in the field.**
Mateus V Gasparino, Arun N Sivakumar, Yixiao Liu, Andres E B Velasquez, Vitor A H Higuti, John Rogers, Huy Tran, Girish Chowdhary
IEEE Robotics and Automation Letters (RA-L) 2022

[8] **Learned visual navigation for under-canopy agricultural robots.**
Arun N Sivakumar, Sahil Modi, **Mateus V Gasparino**, Che Ellis, Andres E B Velasquez, Girish Chowdhary, Saurabh Gupta
Robotics: Science and Systems (RSS) 2021

[9] **Deep Model Predictive Control with Stability Guarantees**
Prabhat K Mishra, **Mateus V Gasparino**, Girish Chowdhary
Accepted at *IEEE Transactions on Automatic Control (TAC)*

Patents

System and method for autonomous navigation of a field robot.
Girish Chowdhary, **Mateus V Gasparino**, Arun N Sivaumar, Vitor A H Higuti, Andres E B Velasquez
EarthSense Inc, 2024. U.S. Patent Application 18/072,114.

TEACHING EXPERIENCE

CS 444 Deep Learning for Computer Vision - Spring 2024

University of Illinois, Urbana-Champaign

Graduate Student Instructor with Prof. Svetlana Lazebnik

SKILLS

- Python / Pytorch
- C / C++
- Matlab
- ROS / ROS 2
- Control Systems

- Deep Learning
- Path Planning
- Autonomous Navigation
- Mapping / SLAM
- Foundation Models