



RESEARCH INTERESTS PLANNING, ROBOTICS, FLEET MANAGEMENT, PARALLEL COMPUTING

Education

- Nov 2022 – Current **PhD in Computer Science, University of Trento, Italy**
Topic: Multi-Agent Planning, Temporal Planning, Industrial Robotics.
Goal: Develop a holistic system that through large language models and logic programming is able to plan and verify schedules for industrial robots and execute them, learning from experience.
GitHub: idra-lab/PLOP
- Oct 2018 – Jul 2022 **Master Degree in Computer Science, University of Trento, Italy, Final mark: 109**
Thesis title: “Comparison of Multi-Agent Path Finding Algorithms for an Industrial Scenario.”
Thesis argument: managing a fleet of AGVs in a human populated environment.
Topics: AGV control, robotics principles, path and goal planning, fleet control.
Other acquired knowledge:
 - Machine learning and deep learning;
 - Real time operating systems;
 - Protocols and middleware for the IoT.
- Sep 2015 – Oct 2018 **Bachelor Degree in Computer Science, University of Trento, Italy**
“Implementation of GPU algorithms for robot path planning.”
Topics: CUDA GPU programming, robot motion planning, comfort control.

Fellowships

- Sep 2022 – Oct 2022 **Research Fellowship – “Predoc”, University of Trento, Italy**
Topics: Multi-Agent Path Finding, fleet management
Goal: Creation of a framework encompassing different MAPF algorithms for testing and scalability analysis

Work Experience

- Sept 2019 – Dec 2019 **Computer Scientist, CreateNet – FBK, Italy**
Work on cutting-edge technologies for control and optimization of agricultural irrigation in a large deployed system.
Topics: C programming language, LoRaWAN infrastructure, electronic sensor and actuators.
- Jan 2019 – Jul 2019 **High School Teacher, ITT Buonarroti-Pozzo, Italy**
Taught computer science to high school students:
1st year: mainly problem solving skills;
2nd year: basics of C programming.

Research Experience

- Dec 2020 – May 2021 **Student, University of Trento, Italy**
Topics:
 - Research on **Dubins** curves for optimal control of vehicles;
 - Implementation on **GPU** of dynamic programming for multi-point Dubinses;
 - **Energetic analysis** of different solutions from embedded systems to server based ones.

Teaching Experience

- Fall 2023 [TA] **Robot Planning & its Applications, University of Trento, Italy**
Role: Class lectures, laboratory exercises, and exams.
- Fall 2023 [Tutor] **Programming 101, University of Trento, Italy**
Role: Extra exercises and clarifications for Programming 101 course.

Publications

- [5] E. Saccon, A. Tikna, D. D. Martini, E. Lamon, M. Roveri, and L. Palopoli, *When prolog meets generative models: A new approach for managing knowledge and planning in robotic applications*, 2023. arXiv: 2309.15049 [cs.R0].
- [4] E. Saccon, "Multi-agent open framework: Developing a holistic system to solve mapf (student abstract)," in *Proceedings of the International Symposium on Combinatorial Search*, vol. 16, 2023, pp. 198–199.
- [3] E. Saccon, L. Palopoli, and M. Roveri, "Comparing multi-agent path finding algorithms in a real industrial scenario," in *AlxIA 2022–Advances in Artificial Intelligence: XXIst International Conference of the Italian Association for Artificial Intelligence, AlxIA 2022, Udine, Italy, November 28–December 2, 2022, Proceedings*. 2023, pp. 184–197. DOI: 10.1007/978-3-031-27181-6_13.
- [2] E. Saccon, P. Bevilacqua, D. Fontanelli, M. Frego, L. Palopoli, and R. Passerone, "Robot Motion Planning: can GPUs be a Game Changer?" *2021 IEEE 45th Annual Computers, Software, and Applications Conference (COMPSAC)*, pp. 21–30, 2021. DOI: 10.1109/COMPSAC51774.2021.00015.
- [1] M. Frego, P. Bevilacqua, E. Saccon, L. Palopoli, and D. Fontanelli, "An Iterative Dynamic Programming Approach to the Multipoint Markov-Dubins Problem," *IEEE Robotics and Automation Letters*, vol. 5, no. 2, pp. 2483–2490, 2020. DOI: 10.1109/LRA.2020.2972787.

Public Speaking

- Jul 2023 **Speaker**, Prague, Czech Republic
16th International Symposium on Combinatorial Search (SoCS 2023)
Presented the extended abstract for the Doctoral Consortium: "Multi-Agent Open Framework: Developing a Holistic System to Solve MAPF"
- Nov 2022 **Speaker**, Udine, Italy
21st International Conference of the Italian Association for Artificial Intelligence (AlxIA 2022)
Presented the conference paper: "Comparing Multi-Agent Path Finding Algorithms in a Real Industrial Scenario"
- Jul 2021 **Speaker**, Madrid (virtual), Spain
IEEE COMPSAC 2021 Intelligent and Resilient Computing for a Collaborative World
Presented the conference paper: "Robot Motion Planning: can GPUs be a Game Changer?"

Skills

Programming Languages	C, C++, Python, Prolog, CPLEX, Matlab, R, Latex, Java, Bash, JavaScript, PolyML
Technologies	Git; CUDA; <i>Robotics</i> : ROS, ROS2, Gazebo, MoveIt; <i>LLMs</i> : GPT, LaMBDA; <i>Machine/Deep Learning</i> : PyTorch, Tensorflow; <i>IoT</i> : Contiki-NG; <i>Web</i> : Django, NodeJS
Sys Admin	Bash command line

Communication and Interpersonal Skills

Good teamworking skills learned through various projects assigned during university courses and participations in Hackathon events (Hackathon Italia 2017, Hackathon FBK 2016, Hackathon Google 2018) and Google Hashcode (in 2019, 2020, 2021, 2022).

Languages

English Full professional knowledge and B2 certified

Enrico Saccon