Enrico Saccon

RESEARCH INTERESTS

PLANNING, ROBOTICS, FLEET MANAGEMENT, PARALLEL COMPUTING

Education

Nov 2022 – Current **PhD in Information Engineering and Computer Science**, *University of Trento*, Italy
Topics: 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 strong acquired knowledge:
- Machine learning and deep learning (Tensorflow and PyTorch);
- Real time operating systems;

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.

Work Experience

Mar 2025 – Nov 2025 **Research Internship**, *Cognitive Robotics Department – DLR*, Munich, Germany
Worked on integrating task and motion planning to develop an holistic system for the generation of executable temporal plan for multiple agents with theoretical guarantees.
Topics: Task and Motion Planning (TAMP), motion primitives, LLMs, optimization.

Sept 2019 – Dec 2019 **Computer Scientist**, *CreateNet – FBK*, Trento, Italy
Work on cutting-edge technologies for control and optimization of agricultural irrigation in a deployed system.
Topics: C programming language, LoRaWAN infrastructure, electronic sensor and actuators.

Jan 2019 – Jul 2019 **High School Teacher**, *ITT Buonarroti-Pozzo*, Trento, Italy
Taught computer science to high school students:
1^{st} year: mainly problem solving skills; 2^{nd} year: basics of C programming.

Research Experience

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

Dec 2020 – May 2021 **Research Project as Student**, *University of Trento*, Italy
- 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.

Summer/Winter Schools

26^{th} – 31^{st} May 2024 **ICAPS 12th Summer School**, *Banff Centre for Arts and Creativity*, Canada
Summer school on task and motion planning.

12^{th} – 16^{th} Feb 2024 **EUSCOTHA: EUregio School on COntrol THeory and Applications**, *University of Trento*, Italy
Winter school on control theory and applications.

Teaching Experience

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icosac

Fall 2024 [TA] **Robot Planning & its Applications**, *University of Trento*, Italy
Role: Class lectures, laboratory exercises, and exams.

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.

Fall 2022 [TA] **Real Time Operating Systems and Middlewares**, *University of Trento*, Italy
Role: Class lectures and exams.

Publications

[9] E. Saccon, D. De Martini, M. Saveriano, E. Lamon, L. Palopoli, and M. Roveri, "Automated Generation of MDPs Using Logic Programming and LLMs for Robotic Applications," *IEEE Robotics and Automation Letters*, vol. 11, no. 2, pp. 1770–1777, 2026. DOI: 10.1109/LRA.2025.3643276.

[8] P. Pastorelli, S. Dagnino, E. Saccon, M. Frego, and L. Palopoli, "Fast shortest path polyline smoothing with G^1 continuity and bounded curvature," *IEEE Robotics and Automation Letters*, vol. 10, no. 4, pp. 3182–3189, 2025. DOI: 10.1109/LRA.2025.3540531.

[7] E. Saccon and M. Frego, "A Machine Learning Approach for the Three-Point Dubins Problem (3PDP)," *Symmetry*, vol. 17, no. 12, 2025, ISSN: 2073-8994. DOI: 10.3390/sym17122133. [Online]. Available: https://www.mdpi.com/2073-8994/17/12/2133.

[6] E. Saccon, A. Tikna, D. D. Martini, E. Lamon, L. Palopoli, and M. Roveri, *A temporal planning framework for multi-agent systems via llm-aided knowledge base management*, 2025. arXiv: 2502.19135 [cs.AI]. [Online]. Available: https://arxiv.org/abs/2502.19135.

[5] E. Saccon, A. Tikna, D. De Martini, E. Lamon, L. Palopoli, and M. Roveri, "When prolog meets generative models: A new approach for managing knowledge and planning in robotic applications," in *2024 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2024, pp. 17 065–17 071.

[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 *AIxIA 2022–Advances in Artificial Intelligence: XXIst International Conference of the Italian Association for Artificial Intelligence, AIxIA 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

Oct 2025 **Speaker**, *Hangzhou*, China
International Conference on Intelligent Robots and Systems 2025 (IROS25)
Presented the IEEE R-AL paper "Fast shortest path polyline smoothing with G^1 continuity and bounded curvature". Presented the work titled "Planning with Natural Language for Task-Oriented Robots" at the SPACE workshop.

Sep 2025 **Speaker**, *Rende*, Italy
International Conference on Logic Programming 2025 (ICLP25)
Presented the work "When Prolog Meets Generative Models: a New Approach for Managing Knowledge and Planning in Robotic Applications – Abstract" at the CALRA workshop.

Sep 2024 **Speaker**, *Santiago De Compostela*, Spain
40th European Conference on Artificial Intelligence (ECAI 2024)
Presented the work "Adaptive and Scalable Knowledge Management for Robotic Applications via Probabilistic Logic Languages" at the Adjustable Autonomy and Physical Embodied Intelligence AAPEI 24 workshop during ECAI24.

Jun 2024 **Speaker**, *Banff*, Canada
34th International Conference on Automated Planning and Scheduling 2024 (ICAPS24)
Presented the paper for the Previously Published Paper track: "When Prolog Meets Generative Models: A New Approach for Managing Knowledge and Planning in Robotic Applications" Presented the extended abstract for the Doctoral Consortium: "Adaptive and Scalable Knowledge Management for Robotic Applications via Probabilistic Logic Languages"

May 2024 **Speaker**, *Tokyo*, Japan
International Conference on Automation and Control 2024 (ICRA24)
Presented the main paper: "When Prolog Meets Generative Models: A New Approach for Managing Knowledge and Planning in Robotic Applications"

Jul 2023 **Speaker**, *Prague*, Czech Republic
16th International Symposium on Combinatorial Search 2023 (SoCS23)
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 (AIxIA 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?"

Reviews

2026 PC Member **ICAPS 2026**

2025 Reviewer for **IEEE ICRA 2026**

2025 PC Member for **PAIS 2025**

\- Reviewer for **IEEE R-AL**

2025 Reviewer for **ICAPS-25**

2025 Subreviewer for **SoCS-25**

Sponsorships

Jun 2024 **ICAPS24 DC Support**, Banff, Canada. As part of the DC, I was awarded a support of ~ 300\$ to register at the ICAPS24 conference.

Jul 2023 **SoCS23 Travel Grant**, Prague, Czech Republic. I was awarded a travel grant of 400 euros.

Skills

Programming Languages: C, C++, Python, Prolog, Matlab, R, Latex, Java, Bash, JavaScript, PolyML

Technologies: **General:** IBM CPLEX, Git; CUDA; OR-tools; **LLMs**: GPT, LaMBDA, Gemini; **Robotics:** ROS, ROS2, Gazebo, MoveIt; **Machine/Deep Learning:** PyTorch, Tensorflow; **Iot:** Contiki-NG; **Web:** Django, NodeJS

Communication and Interpersonal Skills

Good teamworking skills learned through various projects assigned during university courses and partecipations 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

Professional References

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