Enrico Saccon

RESEARCH INTERESTS ROBOTICS APPLICATIONS, FLEET MANAGEMENT, PARALLEL COMPUTING

Education

Nov 22 – Current **PhD in Computer Science**, *University of Trento*, Italy
Topic: Multi-Agent Path Finding (MAPF), AI, 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 to execute them.

Oct 18 – Jul 22 **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 15 – Oct 18 **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 22 – Oct 22 **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 19 – Dec 19 **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 19 – Jul 19 **High School Teacher**, *ITT Buonarroti-Pozzo*, Italy
Responsible for passing the interest in computer science to the next generation.
1^{st} year: mainly problem solving skills;
2^{nd} year: basics of programming with C.

Research Experience

Dec 20 – May 21 **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.

Jul 18 – Oct 18 **Student**, *University of Trento*, Italy
Topics:
- Implementation on GPU of **path planning algorithms** for robotics applications;
- Parallel computing of **clothoids** using CUDA.

Publications

[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.

+39 (339) 8242401 • enricosaccon96@gmail.com • icosac

[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

Jul 23 **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 22 **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 21 **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, Matlab, R, Latex, Java, Bash, JavaScript, Prolog, PolyML
Technologies	Git, CUDA; Machine/Deep Learning: PyTorch, Tensorflow; Iot: Contiki-NG, Django, NodeJS
Sys Admin	Linux

Languages

Italian	Mother tongue
English	Full professional knowledge and B2 certified

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).
Took part in the CoderDojo project for a few months during 2017. The project aims to teach younger people the beauty of coding. This was another occasion to practice teamworking and to test myself.

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I hereby grant permission for the treatment of my personal data for all purposes related to the selection procedure, in compliance with Italian laws artt. 46 and 47 of DPR 445/2000.