Stefano Genetti

PhD Student in Industrial Innovation

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Education

University of Trento — *Trento, Italy*

Master's Degree in Computer Science — *Sept. 2022 - Oct. 2024*

- **Grade** 110/110 *cum laude* | **Final Dissertation:** *"Interpretable DTs through evolutionary RL for SCM"* - Supervisor: professor Giovanni Iacca
- **Relevant coursework:** Data Mining, Distributed Systems, Blockchain, Machine Learning, Deep Learning, Computer Vision, Bio-Inspired Artificial Intelligence, Low-power wireless networking for the Internet of Things

Bachelor's Degree in Computer Science — *Sept. 2019 - Sept. 2022*

- **Grade** 110/110 *cum laude* | **Final Dissertation:** *"Hypergraph Summarization"* - Supervisor: professor Alberto Montresor -
- **Relevant coursework:** Algorithms and Data Structures, Fundamentals of Robotics, Introduction to Machine Learning, Software Engineering, Systems and Networks, Databases, Operating Systems, Computer Architectures

Languages: Italian (mother tongue), English (Cambridge C1 Advanced)

Experience

Adige Spa (BLM Group) - [list of publications] — *Levico Terme, Italy*

PhD student in industrial innovation — *Nov. 2024 - ongoing*

- Research on Industry 4.0 solutions at Adige (BLM Group), a global leader in CNC laser cutting machines, focusing on interpretable, interactive AI for production scheduling through simulation-optimization and evolutionary reinforcement learning with human-in-the-loop. Design and implementation of a supply chain digital twin to support data-driven decision-making. Teaching assistant for Distributed Systems, Computer Architectures, and AI for Medicine. Supervisor of students' projects on AI applications in industrial contexts.

University of Trento - Research project — *Trento, Italy*

Influence Maximization in Hypergraphs using Multi-Objective Evolutionary Algorithms - Main author — *Jan. 2024 - Jun. 2024*

- Research Paper. Conference: PPSN 2024. Developed a novel multi-objective evolutionary algorithm incorporating smart initialization and hypergraph-aware mutation to solve the Influence Maximization problem on hypergraphs. Achieved state-of-the-art results in hypervolume and solution diversity across nine real-world datasets and three propagation models, outperforming five baseline algorithms.

E-Agle Trento Racing Team - — *Trento, Italy*

Member of the software driverless team (Formula Student) — *Oct. 2022 - Dec. 2024*

- My primary role involved creating a Visual SLAM solution that combines the ORB-SLAM3 algorithm with YOLO. This solution enables vehicle localization on the track while simultaneously identifying cones and their coordinates to construct a map of the circuit. The project won the Best Overall Project at the Ready Tensor Computer Vision Projects Expo 2024 [link].

Relevant Projects

From words to bounding boxes: exploring visual grounding using CLIP - — *PyTorch*

University Project — *June 2023 - Sept. 2023*

- Fine-tuning of CLIP to solve the problem of Referring Expression Comprehension by linking natural language descriptions to images to localize target objects. Three distinct architectures have been proposed: a conventional fine-tuning approach, a contrastive learning method inspired by the "fine-tune like you pretrain" concept, and a self-attention-based approach. We assessed the performance on the RefCOCOg dataset.

Distributed Key-Value Store with Data Partitioning and Replication - — *Java, Akka*

University Project — *July. 2023 - Aug. 2023*

- Design and development of a distributed system that implements a peer-to-peer key-value storage service inspired by Amazon Dynamo. The distributed hash table efficiently balances data among interconnected peer nodes, ensuring reliability and accessibility through key-based partitioning. The client nodes perform read and write operations on the distributed database which ensures sequential consistency.

Enhancing Certificate Management through Blockchain Technology - — *Solidity*

University Project — *June 2023 - July 2023*

- Development of a distributed application to streamline certificate management for groups using a private blockchain, IPFS, and an Express-based web service.

Evaluating Dataset portions based on query logs - — *Python*

University Project — *Nov. 2022 - Jan. 2023*

- Development of a sophisticated query recommendation system that suggests queries leading to user-relevant data. We propose a hybrid solution which combines content-based and collaborative methods mitigating the limitations of both approaches.

A mobile robot to pick up LEGO bricks - — *ROS, C++, Python*

University Project — *Dec. 2021 - Feb. 2022*

- Exploration of a known environment with a mobile robot equipped with a 6-DoF-mainpulator in order to localize and classify LEGO bricks to be taken to a proper basket according to some specifications.