Sara Pettinari
Curriculum Vitae
Last update: December 15, 2024

PERSONAL INFORMATION

Sex	Female
Born at	06/10/1996
Nationality	Italian
Email	sara.pettinari@gssi.it

EXPERIENCE

2024	**Postdoctoral Researcher** in Computer Science - Gran Sasso Science Institute (Italy)

EDUCATION

2024	**PhD in Computer Science and Mathematics** - University of Camerino (Italy) - Evaluation: Excellent. Thesis title: *Process-driven Development and Analysis of Multi-Robot Systems.* Supervisor: Prof. Francesco Tiezzi. Co-Supervisor: Dr. Lorenzo Rossi.
2020	**Master Degree in Computer Science** (LM-18) - University of Camerino (Italy) - Mark: 110/110 cum laude. Thesis title: *A Multi-Robot Cooperation using ROS in Smart Agriculture.* Supervisor: Prof. Barbara Re.
2019	**Erasmus+ Project in New Technologies in Computer Science** - Universidad de Murcia, Murcia (Spain)
2018	**Bachelor degree in Computer Science** (L-31) - University of Camerino (Italy) - Mark: 110/110 cum laude. Thesis title: *A scheduling service for a lithographic company.* Supervisor: Prof. Andrea Polini.

Additional Certifications

2019	Teacher training (FOR24) - University of Camerino (Italy)

Courses and Seminars

2022	Robotics and STEM in Schools. Duration: 6 days.
2022	1st Summer School on Process Mining. Duration: 4 days.
2021	2nd Summer School on CPS and IoT. Duration: 4 days.

RESEARCH ACTIVITY

The research activity mainly focuses on model-driven approaches for robotic systems, especially on the mission modeling and enactment via Business Process Management Notation (BPMN) of cooperative multi-robot systems. Additionally to the main topic, other activities concern the use of Process Mining in distributed scenarios, with an emphasis on the analysis of different system perspectives.

Publications

ORCID	0000-0002-5548-9806
[J3]	F. Corradini, **S. Pettinari**, B. Re, L. Rossi, F. Tiezzi. *A Technique for Discovering BPMN Collaboration Diagrams.* Software and Systems Modeling. 1-21. (2024)
[J2]	F. Corradini, **S. Pettinari**, B. Re, L. Rossi, F. Tiezzi. *Executable Digital Process Twins: Towards the Enhancement of Process-Driven Systems.* Big Data and Cognitive Computing, 7(3), 139. (2023)
[J1]	F. Corradini, **S. Pettinari**, B. Re, L. Rossi, F. Tiezzi. *A BPMN-driven framework for Multi-Robot System development.* Robotics and Autonomous Systems, 160, 104322. (2023)

[C5]	A. Giacché, **S. Pettinari**, L. Rossi. *Revealing One-to-Many Event Relationships in Event Knowledge Graphs.* Process Mining Workshops, toappear, 2024
[C4]	F. Corradini, **S. Pettinari**, B. Re, L. Ruschioni, F. Tiezzi. *Enhancing Compatibility in QoS Communication for the Internet of Robotic Things.* ER Forum/Posters/Demos, vol. 3618, 2023
[C3]	F. Corradini, **S. Pettinari**, B. Re, L. Rossi, F. Tiezzi. *A Methodology for the Analysis of Robotic Systems via Process Mining.* Enterprise Design, Operations, and Computing: 117-133, 2023
[C2]	F. Corradini, **S. Pettinari**, B. Re, L. Rossi, F. Tiezzi: *An Approach to Support Digital Process Twin.* DASC/PiCom/CBDCom/CyberSciTech, 1-4, 2022
[C1]	K. Bourr, F. Corradini, **S. Pettinari**, B. Re, L. Rossi, and F. Tiezzi. *Disciplined use of BPMN for mission modeling of Multi-Robot Systems.* In: Proceedings of the Forum at International Conference on the Practice of Enterprise Modeling, vol. 3045, 1-10, CEUR-WS.org, 2021
[B1]	F. Corradini, F. Fornari, **S. Pettinari**, B. Re, L. Rossi, F. Tiezzi. *A BPMN-Based Approach for IoT Systems Engineering.* Fluidware - Internet of Things: 85-105, 2024
Legend	[J*] journal paper [C*] conference or workshop paper [B*] book chapter contribution *Note: author names are listed in alphabetical order*

Research Visiting

2023	Visiting PhD student at TU/e supervised by Prof. Dirk Fahland. Together with the research team and colleagues of Prof. Fahland, Pettinari had the opportunity to collaborate on issues related to the modeling of multi-perspective data and application of process mining techniques. Duration: 3 months.

Research Projects

2024	Member of the founded national project HALO "etHical-aware AdjustabLe autOnomous systems". MIUR - PRIN 2022. Duration: 24 months.
2020	Member of the founded national project SEDUCE "Designing Spatially Distributed Cyber-Physical Systems under Uncertainty". MIUR - PRIN 2017. Duration: 36 months.

Research Groups

2020	Member of the Process and Service Lab (PROS Lab, `https://pros.unicam.it`) at University of Camerino (Italy) . The PROS Lab group is composed of PhD students, post doctoral researchers, and professors with expertise in formal languages, analysis, and verification techniques for service-oriented distributed systems, software engineering, and process-aware information systems.

Speeches and Seminars

Academic seminar:

- *Knowledge Graphs* - lecture for the bachelor course in Knowledge Modeling and Representation (a.y. 2023/24).

- *Process-driven Robotic Systems* - lecture for the master course in Autonomous and Collaborative Robotics (a.y. 2023/24).

- *Process Mining meets Robotic Systems* - lecture for the master course in Process Mining (a.y. 2022/23 - 2023/24).

- *Multi-Robot Systems: how to adapt to the environment* - seminars for courses for transversal skills and orientation (a.y. 2020/21 - 2021/22 - 2023/24).

Conferences and workshops:

- 6th International Conference on Process Mining (2024) [speaker at the *Workshop: What's the Buzz with ObjectS?*].

- 3rd Robotics Software Engineering meeting (2024) [speaker].

- 27th International Conference on the Enterprise Design, Operations and Computing (2023) [speaker].

- 5th International Conference on Process Mining (2023) [participant].

- 1st Italian Conference on Computer Science Education (2023) [participant].

- 20th International Conference on Pervasive Intelligence and Computing (2022) [speaker at the *Workshop on Digital Twins for Business Processes*].

- 24th International Conference on Coordination Models and Languages (2022) [speaker at the *Workshop on Collaboration Mining for Distributed Systems*].

- 14th International Conference on the Practice of Enterprise Modeling (2021) [speaker at the *PoEM Forum*].

Reviewer

Pettinari has been reviewer for the following international conferences and journals.

Conf	International Conference of Process Mining (2024) - (demo track).
	Cooperative Information Systems (2024).
	International Conference on Coordination Models and Languages (2024) - (artefact evaluation).
	Workshop on Collaboration Mining for Distributed Systems (2023).
	Enterprise Design, Operations and Computing (2023).
	Business Process Modeling, Development and Support (2023).
	Engineering for Rural Development (2023).
Journals	Sensors.
	Journal of Computer Languages.
	Journal of Intelligent Information Systems.
	Results in Engineering.
	Complex Systems Informatics and Modeling Quarterly.

SOFTWARE

Some research activities have led to the development of the following software tools.

FaMe	FaMe is a BPMN-driven framework for multi-robot system development. It allows the definition of a robotic mission using BPMN collaborations and the execution of the system exploiting the ROS2 framework. Specifically, the development phases are the modeling, the configuration, and the enactment. *Website: https://pros.unicam.it/fame/*
TALE	The TALE tool integrates the tag-based multi-perspective methodology which aims to support the robotic developer in the automatic extraction of multi-perspective event logs from the execution of a robotic system and analyze them through process mining. The methodology has been designed to foster process mining applications and develop techniques suitable for robotic systems. It allows the system designer to specify tags in the source code and transform them into events to be inserted into the log. The generated event logs are enriched with multi-perspective information (such as space, communication, and resource occupancy), thus defining a multi-perspective event log, suitable for applying process mining techniques. The tool enables the visualization of the analysis results from both behavioral and spatial perspectives. *Website: https://pros.unicam.it/tale/*
Soup	Soup is a WebApp that allows the end user to create an Event Knowledge Graph (EKG). Starting from an event log, saved in a .csv file, the user is guided in creating the EKG to perform object-centric process mining analysis. *Website: https://pros.unicam.it/soup/*

EDUCATIONAL ACTIVITIES

Tutoring

2023	*Gaming Tour project teacher* at Inst. Mestica - Macerata (Italy)
2022	*Gaming Tour project teacher* at Inst. Urbani - Jesi (Italy)
2022	*AppInventor tutor* at Liceo G.Leopardi - Recanati (Italy) and Liceo Scienze Applicate Merloni Miliani - Fabriano (Italy)
2022	*IoT Lab tutor* at ITIS E.Mattei - Recanati (Italy)
2021	*Java Programming tutor* at Univerisy of Camerino (Italy)
2021	*AppInventor tutor* at Liceo E.Medi - Senigallia (Italy)

Thesis Supervision

2022/23	Beatrice Strappa. *Integrating Coding and Computational Thinking in Schools: A Novel Teaching Module.* University of Camerino.
2022/23	Alessio Giacchè. *Un tool a supporto dell'Object-Centric Process Mining.* University of Camerino.
2021/22	Lorenzo Federici, Gianluca Lanchini. *Un tool per l'esecuzione e il monitoring di sistemi multi-robot in BPMN.* University of Camerino.
2021/22	Luca Patarca. *Progettazione e implementazione di API ROS per lo sviluppo di un sistema robotico autonomo.* University of Camerino.
2020/21	Luca Mozzoni. *Programmazione a blocchi di sistemi robotici.* University of Camerino.
2020/21	Graziano Santonocito. *Progettazione e sviluppo di un'applicazione desktop per il controllo di sistemi robotici.* University of Camerino.

LANGUAGES

Italian	Mother tongue
English	B2
Spanish	B2