Livia Lestingi

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Education

Nov. 2019 – May 2023 **Ph.D.** in Information Technology (summa cum laude) — Politecnico di Milano

I obtained the Ph.D. title in **Computer Science and Engineering** at Politecnico di Milano (Department of Electronics, Information, and Bioengineering) in 2023.
My research project focuses on the development of service robots applications involving human-robot **interaction** in service settings. The work combines the reliability of **formal verification** techniques with untraditional models related to **human behavior** and **physiology**.

Nov. 2017 - May 2019 **Postgraduate Program** — Politecnico di Milano School of Management, Cefriel

I have attended a two-year Postgraduate program ("*Master di I Livello*") titled "Development of Innovative Software Products" while working as a Software Developer supported by special grant of Regione Lombardia.
The program enrolls newly-hired professionals and helps them develop both their **technical** and **soft skills**. Technical courses cover topics related to up-to-date technologies and range from Web Development to Cloud Computing. Soft skills workshops deal topics such as Project Management and negotiation.

Oct. 2014 - July 2017 **M.Sc.** in Automation and Control Engineering (summa cum laude) — Politecnico di Milano

I obtained an M.Sc. in 2017 with a thesis titled "HRC-Team: A Model-driven Approach to Formal Verification and Deployment of Collaborative Robotic Applications." The M.Sc. thesis project has been carried out in collaboration with the Italian National Research Council (CNR).
The project's context is the development of safer **collaborative** robotic applications for industrial settings. Politecnico di Milano has developed an innovative **safety analysis** methodology based on satisfiability checking of temporal logic formulae. The contributions of this thesis project are:

- a custom **UML-based** specification language for collaborative robotic application;
- a tool that processes the UML specification to generate the **formal model** compliant with the above-mentioned safety analysis methodology.

Sep. 2011 - Sep. 2014 **B.Sc.** in Automation Engineering — Politecnico di Milano

Publications

Journal & Magazine Publications

1. **L. Lestingi**, D. Zerla, M. M. Bersani, M. Rossi. (2023). *Specification, stochastic modeling and analysis of interactive service robotic applications.* In Robotics and Autonomous Systems. doi:10.1016/j.robot.2023.104387.

2. **L. Lestingi**, M. M. Bersani, M. Rossi. (2022). *Model-Driven Development of Service Robot Applications Dealing with Uncertain Human Behavior.* In IEEE Intelligent Systems. doi:10.1109/MIS.2022.3215698.

3. **L. Lestingi**, M. Askarpour, M.M. Bersani, M. Rossi. (2021). *A Deployment Framework for Formally Verified Human-Robot Interactions..* In IEEE Access. doi:10.1109/ACCESS.2021.3117852.

4. M. Askarpour, **L. Lestingi**, S. Longoni, N. Iannacci, M. Rossi, F. Vicentini. (2021). *Formally-based Model-Driven Development of Collaborative Robotic Applications.* In Journal of Intelligent and Robotic Systems, 102(3), 1-26. doi:10.1007/s10846-021-01386-2.

Conference Publications

5. Bersani M.M., Camilli M., **Lestingi L.**, Mirandola R., Rossi M. (2023). *Explainable human-machine teaming using model checking and interpretable machine learning.* Accepted for publication at Intl. Conf. on Formal Methods in Software Engineering (FormaliSE).

6. Bersani M.M., Camilli M., **Lestingi L.**, Mirandola R., Rossi M., Scandurra P. (2023). *Towards better trust in human-machine teaming through explainable dependability*. In IEEE 20th International Conference on Software Architecture Companion (ICSA-C) (pp. 86-90). doi:10.1109/ICSA-C57050.2023.00029.

7. **L. Lestingi**, C. Sbrolli, P. Scarmozzino, G. Romeo, M.M. Bersani, and M. Rossi. (2022). *Formal Modeling and Verification of Multi-Robot Interactive Scenarios in Service Settings.* In International Conference on Formal Methods in Software Engineering (FormaliSE). doi:10.1145/3524482.3527653

8. **L. Lestingi**, M. Askarpour, M.M. Bersani, M. Rossi. (2020). *A Model-Driven Approach for the Formal Analysis of Human-Robot Interaction Scenarios.* In Proceedings of 2020 IEEE International Conference on Systems, Man, and Cybernetics (SMC). doi:10.1109/SMC42975.2020.9283204.

9. **L. Lestingi**, M. Askarpour, M.M. Bersani, M. Rossi. (2020). *Formal Verification of Human-Robot Interaction in Healthcare Scenarios.* In Proceedings of 18th International Conference on Software Engineering and Formal Methods (SEFM). doi:10.1007/978-3-030-58768-0.

10. M. Askarpour, **L. Lestingi**, F. Buran, M. Rossi, F. Vicentini. (2020). *Model-driven Risk Analysis for the Design of Safe Collaborative Robotic Applications.* In Proceedings of 2020 IEEE International Conference on Human-Machine Systems (ICHMS). doi:10.1109/ICHMS49158.2020.9209450.

Workshop Publications

11. **L. Lestingi** (2021). *Teaching Formal Methods to Software Engineers through Collaborative Learning (Short Paper).* Formal Methods Teaching Workshop. Springer, Cham. doi:10.1007/978-3-030-91550-66

12. **L. Lestingi**, M. Askarpour, M.M. Bersani, M. Rossi. (2020). *Statistical Model Checking of Human-Robot Interaction Scenarios.* In Proceedings of 1st Workshop on Agents and Robots for Reliable Engineered Autonomy (AREA20). doi:arxiv.org/abs/2007.11738.

Awards

2021 **Best Presentation Award** @ Doctoral Symposium held in conjuction with the 24th International Symposium on Formal Methods (FM 2021)

Service

Organizer

Conferences

- **Virtualization Chair** @ International Conferences on Formal Methods in Software Engineering (FormaliSE'22)

PC Member

Conferences

- **Verification, Validation, and Testing Track** @ International Conference on the Quality of Information and Communications Technology (QUATIC 2023)
- **Artifact Evaluation Committee Member** @ International Conferences on Formal Methods in Software Engineering (FormaliSE'23)

Workshops

- Workshop on Agents and Robots for reliable Engineered Autonomy (AREA 2022, 2023)

Reviewer

Journals

- Science of Computer Programming

Conferences

- **Subreviewer** @ International Conference on Computer Safety, Reliability and Security (Safecomp 2023, 2022, 2020)

Speaker

Workshops

- Presentation Title: "Model-driven development of formally verified human-robot interactions" @ 6th Italian Workshop on Embedded Systems (IWES 2021)

Teaching Experience

Feb 2023 - June 2023 **Software Engineering (for Automation)** Politecnico di Milano
Teaching Assistant for Automation and Control Engineering M.Sc. students.

Apr 2020 - June 2023 **Formal Methods for Concurrent and Real-Time Systems** Politecnico di Milano
Teaching Assistant for Computer Science and Engineering M.Sc. students.

Mar 2020 - June 2023 **Fondamenti di Informatica** Politecnico di Milano
Teaching Assistant for Biomedical Engineering B.Sc. students (formerly "Informatica e Elementi di Informatica Medica") .

Oct 2020 - Dec 2022 **Software Engineering Methodologies for Security** Politecnico di Milano/UniBocconi
Teaching Assistant for Cyber Risk Strategy and Governance M.Sc. students.

Dec 2021 - Jan 2022 **Basic Programming Techniques for AI and ML** Fondazione ITS INCOM

Dec 2020 - Sep 2022 **Advanced Programming Techniques in Python** Cefriel@Fastweb Digital Academy

Nov 2020 - Jan 2023 **Basic Programming in Python** Cefriel@Fastweb Digital Academy

Work Experience

May 2023 - **Postdoctoral Researcher** Politecnico di Milano

The research aims at developing techniques for the analysis of industrial and robotic systems, starting from formal models learned automatically from field data.

Nov. 2018 - Oct. 2019 **Front-End Developer** Tinvention S.r.l @ UniCredit Services

As a front-end developer, I took part in re-designing a tool for internal use to the client's credit-risk section.

Jan. 2018 - Oct. 2018 **Big Data Developer** Tinvention S.r.l @ Data Reply IT

I was part of a Big Data Development team working for a primary firm in the mass distribution field. The project involved the re-design of batch processes handling data related to stock and sales monitoring.

Dec. 2017 - Oct. 2019 **Full-Stack Developer** Tinvention S.r.l.

My main job responsibility involved full-stack development for projects targeting clients' requirements.

Oct. 2017 - Nov. 2017 **Full-Stack Development Intern** Tinvention S.r.l.

The internship's goal was to rapidly train the candidate on full-stack development technologies, from database management systems to front-end development.

Skills

Back-End Development

• Python; • C; • Java, JEE, JUnit; • REST WS, SOAP WS; • LUA; • Spring.

Formal Methods

• Uppaal, Uppaal SMC; • zot; • Stochastic Hybrid Automata; • PCTL, MITL; • TRIO.

Control Systems and Robotics

• ROS; • CoppeliaSim (formerly V-Rep); • Matlab, Simulink.

Front-End Development

• Angular • JavaScript, TypeScript; • HTML, CSS; • Bootstrap, Material Design.

Development Support Tools

• Maven, SBT; • GIT, SVN.

Big Data Technologies

• Scala; • Apache Spark; • Apache Kafka, Apache Oozie; • HBase.

Languages

Italian

- Mother tongue.

English

- Spoken: Excellent, Written: Excellent;
- CAE Certification (Dec 2010), Level C1