University Academic Curriculum Vitae

Education since leaving school

- 2018, Bachelor's Degree in Computer Science (University of Naples Federico II)
- 2020, Master's Degree in Computer Science (University of Naples Federico II)
- 2024, PhD in Bioengineering and Robotics – Cognitive Robotics, Interaction and Rehabilitation Technologies

Present appointment

- Postdoctoral Researcher
- Starting date: 01/11/2023
- Level of appointment: Postdoc
- Italian Institute of Technology
- In my current position, I am conducting research on explainable robots' influence in tutoring and ethical decision-making, as well as cognitive architecture for collaborative robotics. I am developing and evaluating ML-driven models for HRI, collaborating on interdisciplinary projects to enhance robots' transparency, supervising MSc students in their thesis work, contributing to the organization of international conferences and workshops on social and cognitive robotics, and actively participating in dissemination events.

Professional experience

Chronological list of all previous employments:

From / to	Job title	Name of academic Institution	Academic level	Responsibilities
01-04-2024 / 30-04-2025	Researcher	University of Naples Parthenope	Assegnista di ricerca (postdoc)	I contributed to a national EU-funded project on robot-assisted cognitive training. Particularly, I focused on developing ML methods for classifying stress and cognitive load in patients with Parkinson's disease and conducting HRI user studies.
01-03-2023 / 30-06-2023	Visiting Researcher	University of Paderborn and University of Bielefeld	PhD student	Joined the German research consortium TRR318 for my PhD period abroad. Specifically, I conducted research on constructing XAI systems to study explanation strategies in human-computer interaction during collaborative decision-making tasks.
01-10-2021 / 30-06-2022	Teaching Assistant	University of Genoa	PhD student	I assisted in teaching and exercise sessions for "Computer Science Fundamentals" for first-year engineering students. The course lasted two semesters and provided both frontal lessons in the class and laboratory

				exercises. The final test was written (in the lab) with an optional oral exam.
01-04-2020 / 31-10-2020	Visiting Researcher	Italian Institute of Technology	External Collaborator (postgraduate)	I developed a cognitive model for human-robot shared perception using the humanoid robot iCub, and conducted user studies to evaluate the model in real HRI scenarios.
01-08-2019 / 31-12-2019	Undergraduate Research Fellow	Italian Institute of Technology	External Collaborator (undergraduate)	I developed a cognitive model to enhance transparency in RL tasks for the iCub robot, and designed and evaluated a human-in-the-loop training approach to improve robot learning interactions.
01-05-2017 / 31-07-2017	Software Engineer	Teoresi S.p.A.	Bachelor's student	I improved the company's calibration processes by developing and testing an engine control unit calibration support system, which is still in use at the Naples facility.

Participation in exhibitions

Design competitions and awards received:

- Best Short Paper Award, 17th International Conference on Social Robotics + AI (ICSR), Naples, Italy, 2025.
- Seal of Excellence Horizon Europe MSCA Postdoctoral Fellowship 2024.
- Invited Talk "XAI in HRI during collaborative decision-making" at the University of Bielefeld (CITEC), Bielefeld, Germany, 2023.
- Travel Grant at the International Symposium Humans at the Centre of HRI (Naver Labs Europe and Inria), Grenoble, France, 2022.
- Best MSc Thesis Award 2020 "Istituto di Biorobotica – Scuola S. Anna, Pisa", Pisa, Italy, 2020.

Experience in academic teaching

- Computer Science Fundamentals, University of Genoa, Computer Science Engineering, first-year engineering students: I effectively supported students in mastering fundamental programming and computational concepts, provided hands-on guidance during exercise sessions, enhancing students' problem-solving skills, contributed to improving course delivery by assisting the Professor in organizing and structuring the lesson materials, and helped create an interactive and engaging learning environment through practical demonstrations and discussions.

Other academic responsibilities

- PC Member for the 3rd International TRR 318 Conference "Contextualizing Explanations" (ContEx25).
- Publication Chair for the 17th International Conference on social Robotics + AI (ICSR25).
- Co-Organizer of the workshop "Robots for Humans": 1st edition held at the 17th International Conference on Advanced Visual Interfaces (AVI24), and 2nd edition that will be held at the IEEE Ro-MAN 2025 Conference.
- Special Session Co-Organizer at the 19th International Conference on Intelligent Autonomous Systems (IAS19), and the 17th International Conference on social Robotics + AI (ICSR25).

Memberships

Membership of academic or professional bodies:

- PC Member for the 3rd International TRR318 Conference "Contextualizing Explanations" (ContEx25).
- Publication Co-Chair for the 17th International Conference on Social Robotics (ICSR25).
- IEEE Member.

Research and scholarships

- Summary of current research and scholarship:
  My current research focuses on explainable robots and their influence on tutoring and collaborative tasks, robots' influence during ethical decision-making, and human-inspired cognitive robotics. I investigate how such explainable systems affect human learning, trust, and decision-making processes. I aim to improve HRI in educational and collaborative contexts by designing and evaluating robotic cognitive architectures. My work also involves user studies to assess the cognitive and behavioral impact of robotic explanations and actions, contributing to the development of more intuitive and socially aware artificial agents.
- Summary of research and scholarship during the previous five years:
  Over the past five years, my research focused on HRI, XAI, and cognitive robotics. My work has spanned multiple institutions, contributing to advancements in robot transparency, decision-making, and user-centered AI design. Regarding XAI in HRI, I explored the role of XAI in collaborative decision-making with social robots, studying how different explanation strategies influence humans understanding and trust towards the artificial agents. Moreover, within the scope of a national EU-funded project about robot-assisted cognitive training, I developed ML models to assess stress and cognitive load in Parkinson's disease patients, integrating social robots into cognitive training interventions. Furthermore, tackling the shared perception problem in HRI, I designed and tested through user studies a mathematical model to improve real-time interaction and coordination in environments presenting perceptual asymmetries. Finally, I worked on robots' behavioral transparency during RL tasks by developing a cognitive model to enhance transparency in robot learning processes, particularly during human-in-the-loop RL. Through interdisciplinary research combining AI, psychology, cognitive science, and robotics, my work contributed to the development of more intuitive, explainable, and human-centered robotic systems and highlighted several social mechanisms with repercussions to the design of artificial agents.
- Summary of significant achievements in research and scholarship:
  - I have authored multiple peer-reviewed publications in leading international journals and conferences such as *Frontiers in Robotics and AI*, *IEEE Transactions on Human-Machine Systems*, *ICRA*, *RO-MAN*, and *ICSR*, addressing key challenges in robot transparency, explainability, and user-centered AI.
  - I was awarded the *Seal of Excellence* by the European Commission for my Horizon Europe MSCA Postdoctoral Fellowship proposal (2024), and received a *Travel Grant* to participate in the International Symposium "Humans at the Centre of HRI" sponsored by Naver Labs Europe and Inria. My MSc thesis was also awarded as the best thesis in 2020 by Scuola Superiore Sant'Anna, Pisa, Italy.
  - I have actively participated in European and national research projects, including the RESTART project, where I led efforts to integrate ML models for cognitive load and stress detection in social robotic systems. During my PhD, I collaborated with the German research consortium TRR318, focusing on the development of co-constructive XAI systems, and conducted research stays at the Universities of Bielefeld and Paderborn.
  - I have contributed to the academic community by co-organizing international workshops (e.g., "Robots for Humans" at AVI and Ro-

MAN), serving as Publication Co-Chair for ICSR25, and acting as PC member for conferences like ContEx25. These roles highlight my ongoing commitment to fostering interdisciplinary dialogue and knowledge dissemination.
- Alongside my research, I have taught undergraduate courses in computer science fundamentals, mentored MSc students, and participated in public engagement activities to promote ethical and transparent robotics.

- Research grants and contracts:
  - I have been awarded the Seal of Excellence for the Horizon Europe MSCA Postdoctoral Fellowship 2024.
  - I received a Travel Grant from Naver Labs Europe and Inria to participate at the 1st International Symposium "Humans at the Centre of HRI" held in Grenoble, France, 2022.
  - My MSc thesis work was awarded as Best Thesis 2020 in Bioengineering and Robotics by the Scuola Superiore Sant'Anna, Pisa, Italy.

Date granted	Award Holder(s)	Funding Body	Title	Amount received
14-02-2025	Dr. Marco Matarese and Prof. Ruth Byrne	Horizon Europe	Seal of Excellence - MSCA Postdoctoral Fellowship 2024	-
14-11-2022	Dr. Marco Matarese	Naver Labs Europe and Inria	Travel Grant for invited students'	-

Publications

Conference papers

- Matarese, M., Guerrieri, V., Kahya, R., Rea, F., Sciutti, A. "On the Influence of Social Robots During Ethical-Decision Making: A Preliminary Study" In *International Conference on Social Robotics + AI*, 2025 (in press).
- D'Errico, L., Esposito, R., Matarese, M., Mele, V., Mungari, A., Roscica, M., Staffa, M. "Emotivation in Human-Robot Interaction for Affective Behavioral Adaptation" In *International Conference on Social Robotics + AI*, 2025 (in press).
- Marino, Luigi, Lorenzo D'Errico, Marco Matarese, Angelo Cangelosi, and Mariacarla Staffa. "Theory of Mind Assessment in Human-Robot Interaction." In *International Conference on Social Robotics*, pp. 33-42. Singapore: Springer Nature Singapore, 2024.
- **Bruzzo, D., Matarese, M.,* Sciutti, A. and Rea, F., 2024, October. Charm or Harm? How Social Robotic Tutors Influence People's Learning with Correct and Incorrect Guidance. In *International Conference on Social Robotics* (pp. 475-487). Singapore: Springer Nature Singapore.
- *Staffa, M., De Benedictis, R., Amaro, I., Citarella, A.A., De Marco, F., Di Biasi, L., Cortellessa, G., Di Napoli, C., Fracasso, F., Giacobbe, C. and Matarese, M.,* 2024, June. First Results of the RESTART National Project. In *Italian Forum of Ambient Assisted Living* (pp. 224-242). Cham: Springer Nature Switzerland.
- *Cocchella, F., Eldardeer, O., Manca, M., Matarese, M., Rezzani, A. and Zedda, E.,* 2024, June. Robots for Humans (RfH 2024)-Embracing Human-Centred Robot Design. In *Proceedings of the 2024 International Conference on Advanced Visual Interfaces* (pp. 1-4).
- **Booshehri, M., Buschmeier, H., Cimiano, P., Kopp, S., Kornowicz, J., Lammert, O., Matarese, M., Mindlin, D., Robrecht, A.S., Vollmer, A.L. and Wagner, P.*, 2024, April. Towards a computational architecture for co-constructive explainable systems. In *Proceedings of the 2024 Workshop on Explainability Engineering* (pp. 20-25).
- *Matarese, M., Cocchella, F., Rea, F. and Sciutti, A., 2023, August. Natural Born Explainees: how users' personality traits shape the human-robot interaction with explainable robots. In *2023 32nd IEEE*

International Conference on Robot and Human Interactive Communication (RO-MAN) (pp. 1786-1793). IEEE.

- *Matarese, M., Cocchella, F., Rea, F. and Sciutti, A., 2023, May. Ex (plainable) machina: how social-implicit xai affects complex human-robot teaming tasks. In *2023 IEEE International Conference on Robotics and Automation (ICRA)* (pp. 11986-11993). IEEE.
- Rossi, S., Cimmino, T., Matarese, M. and Raiano, M., 2019, October. Coherent and incoherent robot emotional behavior for humorous and engaging recommendations. In *2019 28th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)* (pp. 1-6). IEEE.

Journal articles in refereed academic journals

- Matarese, M., Rea, F., Rohlfing, K.J., Sciutti, A., 2025. Let people fail! Exploring the influence of explainable virtual and robotic agents in learning-by-doing tasks. *Transactions in Human-Robot Interaction (under review)*.
- *Bečková, I., Pócoš, Š., Belgiovine, G., Matarese, M., Eldardeer, O., Sciutti, A. and Mazzola, C., 2025. A multi-modal explainability approach for human-aware robots in multi-party conversation. *Computer Vision and Image Understanding*, p.104304. 10.1016/j.cviu.2025.104304
- *Matarese, M., Rea, F., Rohlfing, K.J. and Sciutti, A., 2025. How informative is your XAI? Assessing the quality of explanations through information power. *Frontiers in Computer Science*, *6*, p.1412341. 10.3389/fcomp.2024.1412341
- *Matarese, M., Rea, F. and Sciutti, A., 2022. Perception is only real when shared: A mathematical model for collaborative shared perception in human-robot interaction. *Frontiers in Robotics and AI*, *9*, p.733954. 10.3389/frobt.2022.733954
- Matarese, M., Sciutti, A., Rea, F. and Rossi, S., 2021. Toward robots' behavioral transparency of temporal difference reinforcement learning with a human teacher. *IEEE Transactions on Human-Machine Systems*, *51*(6), pp.578-589. 10.1109/THMS.2021.3116119

Other publications

- Ruggiero, F., Matarese, M., Sciutti, A. and Staffa, M., 2024. Enhancing Cognitive Training: Investigating the Impact of a Suggestion-Offering Robot on Performance and Satisfaction.
- Matarese, M., Rea, F., Rohlfing, K. J., & Sciutti, A. (2024). Let people fail! Exploring the influence of explainable virtual and robotic agents in learning-by-doing tasks. *arXiv preprint arXiv:2411.10176*.
- Matarese, M., 2024. XAI in HRI: A Journey to the Centre of the Explainability.
- Matarese, M., Rea, F. and Sciutti, A., 2021. A user-centred framework for explainable artificial intelligence in human-robot interaction. *arXiv preprint arXiv:2109.12912*.

Further data

Presentations at scientific conferences over past 3 years:

- ICSR 25: On the Influence of Social Robots During Ethical-Decision Making: A Preliminary Study
- RO-MAN 25: Do Androids Dream of Ethical Decisions? A Research Plan on Robot Influence in Ethical Decision-Making
- ICSR 24: "Charm or Harm? How Social Robotic Tutors Influence People's Learning with Correct and Incorrect Guidance" (full paper); "Road to a task-agnostic suggestion offering strategy in robot-assisted cognitive training" (workshop).
- AVI 24: "Enhancing Cognitive Training: Investigating the Impact of a Suggestion-Offering Robot on Performance and Satisfaction" (workshop).

- RO-MAN 23: “Natural Born Explainees: how users’ personality traits shape the human-robot interaction with explainable robots” (full paper).
- ICRA 23: “Ex (plainable) Machina: how social-implicit XAI affects complex human-robot teaming tasks” (full paper).
- HRI 23: “How much informative is your XAI? A decision-making assessment task to objectively measure the goodness of explanations” (workshop).

Statement of interest

I am writing to express my strong interest in the RTD-A position at the Faculty of Engineering of the Free University of Bozen-Bolzano (Unibz). With a background that combines artificial intelligence, human-robot interaction (HRI), and explainable AI (XAI), my research is driven by a commitment to building socially intelligent, transparent, and ethically aligned robotic systems. I am particularly excited by Unibz’s international and interdisciplinary approach, which aligns well with my academic path and research ambitions.

I hold a PhD in Bioengineering and Robotics with a specialization in Cognitive Robotics, Interaction, and Rehabilitation Technologies, awarded in 2024. Currently, I am a Postdoctoral Researcher at the Italian Institute of Technology, where I explore the role of explainability in robotic tutoring, ethical decision-making, and bio-inspired cognitive robotics. My work focuses on integrating machine learning and cognitive modeling to enhance human understanding and trust in robot behavior. These interests have led to contributions in top-tier conferences (e.g., ICRA, RO-MAN, ICSR) and journals in the HRI and AI communities.

Throughout my academic journey, I have pursued research at leading institutions, including the Universities of Naples Parthenope, Paderborn, Bielefeld, and Bratislava, contributing to European-funded projects and international collaborations. My recent experience in the RESTART national project on robot-assisted cognitive training and the TERAIS European project on robotics and AI demonstrates my ability to translate research into impactful applications, especially in delicate contexts such as healthcare and education.

Beyond research, I bring teaching experience from the University of Genoa, where I served as a teaching assistant for first-year engineering students, developing interactive lessons and laboratory sessions. I have also supervised MSc theses and co-organized international workshops and conference sessions, which reflects my commitment to academic service and community engagement.

Joining the Free University of Bozen-Bolzano would allow me to further develop my research interests that bridge AI, cognitive science, and user-centered design, fostering collaborative and explainable technologies for real-world settings. I am also enthusiastic about contributing to the faculty's teaching portfolio, supporting internationalization, and fostering partnerships across disciplines. I believe my profile aligns with the university’s mission of promoting high-quality, research-led education and innovation in engineering.

Language competence

- Italian: native.
- English: professional.
- Spanish: basic.

19/09/2025