University Academic Curriculum Vitae

Personal information

Name: **Luca Gualtieri**
OrcID: https://orcid.org/0000-0002-4976-1893

Education since leaving school

- 2021 - **PhD in Sustainable Energy and Technologies**; University of Bozen-Bolzano. Dissertation "Methodologies and Guidelines for the Design of Safe and Ergonomic Collaborative Robotic Assembly Systems in Industrial Settings", summa cum laude.
- 2016 - **Master's Degree in Logistics and Production Engineering**; University of Padua.
- 2013 - **Bachelor's Degree in Logistics and Production Engineering**; University of Bozen-Bolzano.

Present appointment

- Appointed **Assistant Professor of Manufacturing Systems and Technologies (SSD ING-IND/16)**, Industrial Engineering and Automation (IEA) group of the Faculty of Engineering of the Free University of Bozen-Bolzano (contract to be started on the 15th of May 2023).
- **Member of the Editorial Board** of the journal "Production & Manufacturing Research" (Taylor & Francis), Scopus indexed Q1.
- **Member of the Reviewer Board** for the journal "Applied Sciences" (MDPI), Scopus indexed Q2.
- **Associate member** of "Società Italiana di Ergonomia e Fattori Umani" (SIE) (https://societadiergonomia.it).
- **Member of the Working Group** on "Human Robot Collaboration" - International Association of Learning Factories (IALF), expertise in safety and ergonomics (https://ialf-online.net/index.php/activities/working-groups.html#work-based-learning).
- **Vice-chair of the standing committee** "Education" for the International Association for Axiomatic Design (IAAD).

Professional experience

Chronological list of all previous employments

From / to	Job title	Name of company	Responsibilities
December 2022 – May 2023	**Senior Technologist (1st level) (ING-IND/17)**	Faculty of Engineering, Free University of Bozen-Bolzano	Main activities refer to support research activities of the Smart Mini factory lab for Industry 4.0, particularly focusing on (i) anthropocentric human-machine interaction, (ii) operator's occupational health, safety, and ergonomics, (iii) digital

			tools and simulations for workplaces and processes optimization.
December 2021 – December 2022	**Research Assistant (AR) (ING-IND/17)**	Faculty of Science and Technology, Free University of Bozen-Bolzano	Title of the research project: Mini Factory (ING-IND/17). Particularly focusing on SMEs, the main activities refer to (i) occupational safety and physical/cognitive ergonomics in production systems, (ii) planning, simulation, and evaluation of industrial plants with digital tools, (iii) digital twin of anthropocentric collaborative human-robot production systems.
December 2020 – December 2021	**Research Assistant (AR) (ING-IND/16)**	Faculty of Science and Technology, Free University of Bozen-Bolzano	Title of the research project: Safety and ergonomics in hybrid and partially automated manufacturing systems (ING-IND/16). Particularly focusing on SMEs, the main activities refer to (i) the conversion of manual to collaborative robotics-based production processes, (ii) human-machine task allocation and optimization, (iii) guidelines for the design of safe, ergonomic, and efficient human-centered collaborative systems.
December 2019 – December 2020	**Research Assistant (AR) (ING-IND/13)**	Faculty of Science and Technology, Free University of Bozen-Bolzano	Title of the research project: Safety and Ergonomics in Collaborative Robotics (ING-IND/13). Particularly focusing on SMEs, the main activities refer to (i) models for the evaluation of the potential of collaborative robotics in production plants, (ii) procedures for the realization of safe and ergonomic production systems based on collaborative robotics.
December 2017 – December 2019	**Research Assistant (AR) (ING-IND/13)**	Faculty of Science and Technology, Free University of Bozen-Bolzano	Title of the research project: Control and optimization of high-performance automatic machines for SMEs (ING-IND/13). Particularly focusing on SMEs, the main activities refer to (i) the optimization of the performance of industrial robots, (ii) the optimization of the motion of mechatronic systems interacting with humans in production.
December 2016 – November 2017	**Research Assistant (AR) (ING-IND/16)**	Industrial Engineering Department, University of Padova	Title of the research project: Improvement of industrial personnel skills for specification and verification of geometric tolerances (ING-IND/16). Main activities refer to the development and management of innovative Blended Learning didactical projects regarding Geometrical Product Specifications, Coordinate Metrology and Digital Manufacturing in automotive and aerospace industrial fields.

October 2015 - March 2016	**Trainee at the Health, Safety and Environment (SAE) office**	Acciaierie Valbruna S.p.a.	The prime occupation was to help the occupational health and safety manager and the environmental manager to perform their evaluations of operators' work conditions, proposing useful improvements in terms of workplace safety and health.
May 2015 - October 2015	**University trainee**	IVECO D.V.D.	My prime occupation was supporting materials and logistics managers in the evaluation and development of new lean "World Class Manufacturing" projects for the improvement of the assembly line efficiency of military vehicles.
August 2010 - September 2010	**Plant maintenance technician supporter**	V.O.G. Products	My prime occupation was supporting the mechanical team in ordinary and extraordinary plant maintenance works.
July 2010 - August 2010	**Workman**	Assemblaggio cavi s.r.l.	My prime occupation was the manual assembly of industrial electrical components for automotive.

National and international projects participation

I have been part as co-PI or team member in different research projects that are listed below. I have been involved in **16 financed projects** with a total volume of **9.848.516,00 €** and a total funding amount for unibz of **1.510.000,00 €.**

Unibz research projects

1. **Design4SusMan** – Design an Erasmus Mundus Master on Digital and Sustainable Manufacturing. Erasmus European Union. Role: unibz team member. Duration: 01.10.2022 – 31.12.2023. Budget unibz: € 55.000,00.
2. **SestoSenso - Physical Intelligence for Smart and Safe Human-Robot Interaction**. H2020 Research and Innovation Action. Role: unibz team member. Duration: 01.10.2022 – 30.09.2025. Funding Body: HORIZON EUROPE. Budget unibz: € 300.000,00 (total budget € 5,619,026.00). http://sestosenso.eu/.
3. **SME5.0 - A Strategic Roadmap Towards the Next Level of Intelligent, Sustainable and Human-Centred SMEs**. EU MSCA project of unibz as project coordinator. Role: task leader WP9.3 (Implementation Guidelines for Empowering Workers). Role: Local tutor for incoming researchers and team member. Duration: 01.01.2023 – 31.12.2026. Funding Body: HORIZON EUROPE. Budget unibz: € 317,400.00 (total budget € 1,168,400.00). https://cordis.europa.eu/project/id/101086487.
4. **CONFUCIUS – Study the past if you would define the future: Discovering Patterns in Scheduling and Monitoring Data**. Internal project unibz. Role: unibz team member. Duration: 01.07.2021 – 31.12.2023. Budget unibz: € 110.000,00.
5. **SME 4.0 - Smart Manufacturing and Logistics in an X-to-order and Mass Customization Environment**. EU MSCA project of unibz as project coordinator. Role: unibz team member. Duration: 01.01.2017 –

31.12.2021. Funding Body: H2020 MSCA RISE 2016. Budget unibz: € 311.500,00 (total budget € 783.000,00). https://www.sme40.eu/.

6. **WIRECOBOTS - Wire harness assembly using collaborative robots to increase efficiency and ergonomics**. Research project and pilot implementation with the company Carretta srl. Role: unibz team member. Duration: 15.04.2019 – 14.12.2020. Funding Body: ESMERA – EU Cascade funding. Budget unibz: € 100.000,00 (total budget € 200.000,00). https://www.wirecobots.com/.
7. **CoHoMe - Comparison and Homogenization Of Safety Measurements**. Research project with Joanneum Research and Technical University Graz. Role: unibz team member. Duration: 15.06.2019 – 14.03.2020. Funding Body: COVR – EU Cascade funding. Budget unibz: € 20.000,00 (total budget € 100.000,00). https://www.joanneum.at/en/robotics/reference-projects/cohome.
8. **E-EDU 4.0 - Engineering Education 4.0**. Role: unibz team member. Research project with a consortium of international partners. Duration: 01.05.2018 – 30.04.2021. Funding Body: European Regional Development Fund (ERDF) - Interreg Italy-Austria. Budget unibz: € 180.000,00 (total budget € 1.150.000,00). https://www.researchgate.net/project/E-EDU-40-Engineering-Education-40.

Unibz commissioned projects

9. **AR-CO-2** – Concettualizzazione di una postazione di training assistita da tecnologia AR e tecniche di VM per l'attrezzaggio di macchinari complessi. Commissioned by Global Wafers (Sinigo). Role: unibz CO-I. Duration: 01.04.2023 – 30.09.2023. Funding Body: NOI Lab bonus. Budget unibz: € 14.100,00.
10. **AR-CO** – Studio preliminare relativo all'uso di una soluzione innovativa a supporto visivo agli operatori basata su tecnologia di "Augmented Reality" e combinata con tecniche di "Visual Management". Commissioned by Global Wafers (Sinigo). Role: unibz team member. Duration: 07.12.2022 – 31.03.2023. Funding Body: NOI Lab bonus. Budget unibz: € 7.000,00.
11. **GW-1** – Evaluation and proposal of robotic solutions for resistivity measurement and optimized layout scenarios. Commissioned by Global Wafers (Sinigo). Role: unibz team member. Duration: 01.08.2022 – 15.12.2022. Funding Body: NOI Lab bonus. Budget unibz: € 8.000,00.
12. **DURST-1** – Automation concept for the production of a special nozzle. Commissioned by Durst Phototechnik (Bressanone). Role: unibz team member. Duration: 01.01.2021 – 30.06.2021. Funding Body: LG-14. Budget unibz: € 55.000,00.
13. **SIM-EH-BZ** – Simulation Study of the Emergency Department in the Hospital of Bolzano. Commissioned by Südtiroler Sanitätsbetrieb (SABES), Azienda Sanitaria dell'Alto Adige (ASDAA) (Bolzano). Role: unibz team member. Duration: 01.07.2019 – 24.11.2019. Funding Body: /. Budget unibz: € 20.000,00.
14. **PROSTAHL** – Collaborative robotics for the production of individual stainless-steel furniture. Commissioned by Prostahl srl (Caldaro). Role: unibz team member. Duration: 01.12.2018 – 31.05.2019. Funding Body: LG-14. Budget unibz: € 12.000,00.

Previous research projects (not unibz)

15. **GPSV Toolbox –** Geometrical Product Specification and Verification as Toolbox to meet up-to-date Technical Requirements. Project for technical education in collaboration with an international consortium. Role: unipd team member. Duration: 01.09.2015 – 31.08.2018. Funding Body: European Erasmus+ KA2. Total budget: 390.855,00 €. http://gpsvtoolbox.ath.eu/.
16. **CoMeT –** European Training for Coordinate Metrology 4.0. Project for technical education in collaboration with an international consortium. Role: unipd team member. Duration: 01.09.2016 – 31.08.2019. Funding Body: European Erasmus+ KA2. Total budget: 437.235,00 €. https://www.cm-train.org/website_comet4eu/it/.

Experience in academic teaching

- **Invited visiting lecturer** in the "Collaborative Intelligence for Safety Critical Systems Bootcamp 2023" PhD Summer School (Technological University Dublin). 12-16 of June 2023. Teaching hours: 8 hours.
- **Contract lecturer** in the "Industrial Collaborative Robotics" course (Master Degree in Industrial and Mechanical Engineering, Free University of Bozen-Bolzano). Academic year 2022-2023. Teaching hours: 10 hours, 3 ECTS. (See unibz students' course evaluation as an attached document).
- **Visiting lecturer** in the "Human robot collaboration in manufacturing 4.0" PhD course of the XXXVIII cycle (University of Modena e Reggio Emilia). Academic year: 2022-2023. Academic year 2022-2023. Teaching hours: 6 hours, 3 ECTS.
- **Visiting lecturer** in the "Industrial Automation" course (Bachelor Degree in Industrial Engineering, University of Malta). Academic year 2022-2023.
- **Contract lecturer** in the "Digital Factory Planning and Maintenance" course (Master Degree in Industrial and Mechanical Engineering, Free University of Bozen-Bolzano). Academic year 2021-2022. Teaching hours: 24 hours, 6 ECTS. (See unibz students' course evaluation as an attached document).
- **Visiting lecturer** in the "Production management, simulation of manufacturing plants" international week, 14-18 March 2022, and 13-17 March 2023, organized by the Faculty of Engineering Vitoria-Gasteiz, University of the Basque Country. Teaching hours: 1,5 hours.
- **Contract lecturer** in the "Manufacturing Technology" course (Professional Bachelor in Wood Engineering, Free University of Bozen-Bolzano). Academic year 2021-2022. Teaching hours: 36 hours, 6 ECTS.
- **Contract lecturer and responsible for group exercises** in the "Industrial Collaborative Robotics" summer school (Master Degree in Industrial and Mechanical Engineering, Free University of Bozen-Bolzano). Academic year 2021-2022. Teaching hours: 10 hours, 3 ECTS.
- **Contract lecturer and responsible for group exercises** in the "Design of Complex Systems and Artificial Intelligence in Design" summer school (Master Degree in Industrial and Mechanical Engineering, Free University of Bozen-Bolzano). Academic year 2021-2022. Teaching hours: 20 hours, 2 ECTS.
- **Responsible for the module** "Robotica e Automazione" in the Digital and Technology Summer Camp, 21-25 June 2021, and 27 June-1 July

2022, organized by the Free University of Bozen-Bolzano for hosting students for local high schools. Teaching hours: 8.

- **Responsible for group exercises** "Design of a safe collaborative work cell for the assembly of pneumatic cylinders" in the Euclides International Week "Industry 4.0: Technologies and Management", 9-19 March 2021, organized by the Free University of Bozen-Bolzano in collaboration with the Universitat de Girona, Universidad del Pais Vasco, Aniversiteit Antwerpen, KU Leuven and Università degli Studi di Udine. Teaching hours: 7.
- **Teaching assistant** and responsible for group exercises in the "Production Systems and Industrial Logistics" course (Bachelor in Industrial and Mechanical Engineering, Free University of Bozen-Bolzano). Academic year 2019-2020, 2020-2021, 2022-2023. Teaching hours: 12 hours, 10 ECTS.
- **Teaching assistant** and responsible for group exercises in the 1st International "Summer School on Axiomatic Design", 23-25 July 2019, organized by the Free University of Bozen-Bolzano in collaboration with Worcester Polytechnic Institute (USA), Montauniversität Leoben (Austria) and Universidad de Ibagué (Colombia). Teaching hours: 20 hours, 2 ECTS.

Scientific memberships

- **Associate member** of "Società Italiana di Ergonomia e Fattori Umani" (SIE) (https://societadiergonomia.it).
- **Member of the Working Group** on "Human Robot Collaboration" - International Association of Learning Factories (IALF), expertise in safety and ergonomics (https://ialf-online.net/index.php/activities/working-groups.html#work-based-learning).
- **Vice-chair of the standing committee** "Education" for the International Association for Axiomatic Design (IAAD).
- **Member of the scientific committee** of the "IEEE International Conference on Mechanical and Intelligent Manufacturing Technologies" (ICMIMT, 2021-2023), "IEEE International Conference on Electrical, Computer, Communications and Mechatronics Engineering" (ICECCME, 2021-2022), "International Conference on Intelligent Systems and Human-Computer Interaction" (ISHCI, 2023), "International Symposium on Industrial Engineering and Automation" (ISIEA, 2022-2023).

Editorial activities

- **Member of the Editorial Board** of the journal "Production & Manufacturing Research" (Taylor & Francis), Q1. https://www.tandfonline.com/action/journalInformation?show=editorialBoard&journalCode=tpmr20.
- **Member of the Reviewer Board** for the journal "Applied Sciences" (MDPI), Q2. https://www.mdpi.com/journal/applsci/submission_reviewers.
- **Managing guest editor** for the Special Issue on "Human Factors and Cognitive Ergonomics in Advanced Industrial Human-Robot Interaction", Frontiers in Robotics and AI (Frontiers), Q2. Guest editors: Dr. Gualtieri (Free University of Bozen-Bolzano), Dr. Fraboni (University of Bologna), Prof. Billing (University of Skövde), Prof. Thorvald (University of Skövde). https://www.frontiersin.org/research-topics/47954/human-factors-and-cognitive-ergonomics-in-advanced-industrial-human-robot-interaction.

- **Managing guest editor** for the Special Issue on "Design and Application of Collaborative Robotics", Applied Sciences (MDPI), Q2. Guest editors: Dr. Gualtieri (Free University of Bozen-Bolzano), Dr. Fraboni (University of Bologna), Dr. Pini (University of Modena and Reggio Emilia), Dr. Francalanza (University of Malta). https://www.mdpi.com/journal/applsci/special_issues/application_collaborative_robotics.
- **Guest editor** for the Special Issue on "Assessment, Validation and Improvement of Safety and Ergonomics in Industrial Human-Robot Interaction", Machines (MDPI), Q2. Guest editors: Dr. Valori (National Research Council of Italy), Dr. Gualtieri (Free University of Bozen-Bolzano), Dr. Saenz (Fraunhofer Institute for Factory Operation and Automation IFF), Dr. Fassi (National Research Council of Italy). https://www.mdpi.com/journal/machines/special_issues/LQLE57LGKX.

Reviewer activities

- **Reviewer for the journals**: "Robotics and Computer Integrated Manufacturing" (Q1), "IEEE Transactions on Engineering Management" (Q1), "Human Factors: The Journal of the Human Factors and Ergonomics Society" (Q1), "IEEE Robotics and Automation Letters" (Q1), , "Safety Science" (Q1), "Production & Manufacturing Research" (Q1), "Journal of Manufacturing Systems" (Q1), "Journal of Manufacturing Technology Management" (Q1), "Applied Science" (Q2), "Sustainability" (Q2), "Sensors" (Q2), "Behaviour & Information Technology" (Q2), "Frontiers in Robotics and AI" (Q2), "International Journal of Human Factors and Ergonomics" (Q4).
- **Reviewer for the conferences**: 2nd International Symposium on Industrial Engineering and Automation (ISIEA, June 22-23.2023), 4th International Conference on Industry 4.0 and Smart Manufacturing (ISM, November 2-4.2022), IEEE 13th International Conference on Mechanical and Intelligent Manufacturing Technologies (ICMIMT, Mai 25-27.2022), 12th International Conference on Axiomatic Design (ICAD, October 8-11.2018).

Research areas

Safety and ergonomics in intelligent human-machine interaction

- Study of integrated solutions for the improvement of mechanical safety, as well as cognitive and physical ergonomics, in intelligent industrial human-robot interaction;
- Study of methodologies for the anthropocentric design of advanced collaborative robotics systems and related logics for human-machine task allocation;
- Analysis and feasibility studies for the integration of new and human-centered collaborative robotics solutions into existing production cycles.

Human factors for advanced manufacturing systems design

- Development of new methodologies for the enhancement of operator's psychophysical wellbeing in manufacturing systems;
- Use of digital tools and simulations for the concurrent and integrated design of the ergonomic and human-centered manufacturing workplaces and processes;

- Study of the use of enabling and innovative technologies as assistance solutions to reduce physical and/or cognitive (over)loads and improve production performances in sociotechnical systems.

Augmented Reality-based workers assistance and training

- Development of AR-based innovative training modalities to support unskilled operators in understanding complex assembly systems.
- Integration of Visual Management tools and AR technology to enhance the operator's training efficacy;
- Study of solutions for AR-based smart data visualization and management for the reduction of system's assembly errors and the enhancement of production performances (e.g. time and flexibility).

Social sustainability in Industry 5.0 and inclusion of vulnerable workers in manufacturing systems

- Development of technology-oriented methodologies for the design of assisted and inclusive manufacturing workplaces to enhance the well-being and satisfaction of vulnerable workers;
- Study of the use of Industry 5.0 enabling technologies for the reduction of discrimination and improvement of accessibility of vulnerable workers in production systems and processes;
- Development of technology-based and adaptive assisted workplaces for the reduction of the performance gap between operators with and without disabilities.

Publications

Bibliometric indicators

Only publications indexed in the database Scopus are considered
H index:12;
Citations: 532.

International peer-reviewed journal papers

1. Panchetti, T., Pietrantoni, L., Puzzo, G., **Gualtieri, L.**, Fraboni, F. (2023). Assessing the Relationship between Cognitive Workload, Workstation Design, User Acceptance and Trust in Collaborative Robots. Applied Sciences, 13(3), 1720. DOI: https://doi.org/10.3390/app13031720. Scopus indexed (Quartile 2).
2. **Gualtieri, L.**, Rauch, E., Vidoni, R. (2022). Human-robot activity allocation algorithm for the redesign of manual assembly systems into human-robot collaborative assembly. International Journal of Computer Integrated Manufacturing, 36(2), 308-333. DOI: https://doi.org/10.1080/0951192X.2022.2083687. Scopus indexed (Quartile 1).
3. **Gualtieri, L.**, Fraboni, F., De Marchi, M., Rauch, E. (2022). Development and evaluation of design guidelines for cognitive ergonomics in human-robot collaborative assembly systems. Applied Ergonomics, 104, 103807. DOI: https://doi.org/10.1016/j.apergo.2022.103807. Scopus indexed (Quartile 1).
4. **Gualtieri, L.**, Rauch, E., Vidoni, R. (2022). Development and validation of guidelines for safety in human-robot collaborative assembly

systems. Computers & Industrial Engineering, 163, 107801. DOI: https://doi.org/10.1016/j.cie.2021.107801. Scopus indexed (Quartile 1).

5. Palomba, I., **Gualtieri, L.**, Rojas, R., Rauch, E., Vidoni, R., Ghedin, A. (2021). Mechatronic re-design of a manual assembly workstation into a collaborative one for wire harness assemblies. Robotics, 10(1), 43. DOI: https://doi.org/10.3390/robotics10010043. Scopus indexed (Quartile 1).
6. **Gualtieri, L.**, Rauch, E., Vidoni, R. (2021). Methodology for the definition of the optimal assembly cycle and calculation of the optimized assembly cycle time in human-robot collaborative assembly. The International Journal of Advanced Manufacturing Technology, 113(7-8), 2369-2384. DOI: https://doi.org/10.1007/s00170-021-06653-y. Scopus indexed (Quartile 1)
7. **Gualtieri, L.**, Rauch, E., Vidoni, R. (2021). Emerging research fields in safety and ergonomics in industrial collaborative robotics: A systematic literature review. Robotics and Computer-Integrated Manufacturing, 67, 101998. DOI: https://doi.org/10.1016/j.rcim.2020.101998. Scopus indexed (Quartile 1).
8. **Gualtieri, L.**, Palomba, I., Merati, F. A., Rauch, E., Vidoni, R. (2020). Design of human-centered collaborative assembly workstations for the improvement of operators' physical ergonomics and production efficiency: A case study. Sustainability, 12(9), 3606. DOI: https://doi.org/10.3390/su12093606. Scopus indexed (Quartile 2).
9. Rauch, E., Unterhofer, M., Rojas, R. A., **Gualtieri, L.**, Woschank, M., Matt, D. T. (2020). A maturity level-based assessment tool to enhance the implementation of industry 4.0 in small and medium-sized enterprises. Sustainability, 12(9), 3559. DOI: https://doi.org/10.3390/su12093559. Scopus indexed (Quartile 2).

Papers at conferences

10. **Gualtieri, L.**, Revolti, A., Dallasega, P. (2023). Training support with Augmented Reality for Machine Setup: A Case Study in the Process Industry. Letures Notes in Networks and Systems. (Accepted paper).
11. **Gualtieri, L.**, Fraboni, F., Brendel, H., Dallasega, P., Rauch, E. Pietrantoni, L. (2023). Guidelines for the integration of cognitive ergonomics in the design of human-centered and collaborative robotics applications. Procedia CIRP. (Accepted paper).
12. **Gualtieri, L.**, Revolti, A., Dallasega, P. (2023). A human-centered conceptual model for integrating Augmented Reality and Dynamic Digital Models to reduce occupational risks in industrial contexts. Procedia Computer Science, 217, 765-773. DOI: https://doi.org/10.1016/j.procs.2022.12.273.
13. Miro, M., Glogowski, P., Lemmerz, K., Kuhlenkoetter, B., **Gualtieri, L.**, Rauch, E., ... & Kumar, A. A. (2022). Simulation technology and application of safe collaborative operations in human-robot interaction. In ISR Europe 2022; 54th International Symposium on Robotics (pp. 1- 9). VDE. DOI: http://hdl.handle.net/10993/53950
14. **Gualtieri, L.**, Fraboni, F., De Marchi, M., Rauch, E. (2022). Evaluation of variables of cognitive ergonomics in industrial human-robot collaborative

assembly systems. In Proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021) Volume V: Methods & Approaches 21 (pp. 266-273). Springer International Publishing. DOI: https://doi.org/10.1007/978-3-030-74614-8_32

15. Fraboni, F., **Gualtieri, L.**, Millo, F., De Marchi, M., Pietrantoni, L., Rauch, E. (2022). Human-robot collaboration during assembly tasks: the cognitive effects of collaborative assembly workstation features. In Proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021) Volume V: Methods & Approaches 21 (pp. 242-249). Springer International Publishing. DOI: https://doi.org/10.1007/978-3-030-74614-8_29
16. De Marchi, M., **Gualtieri, L.**, Rojas, R. A., Rauch, E., Cividini, F. (2021,). Integration of an Artificial Intelligence Based 3D Perception Device into a Human-Robot Collaborative Workstation for Learning Factories. In Proceedings of the Conference on Learning Factories (CLF). DOI: http://dx.doi.org/10.2139/ssrn.3863966
17. Merati, F. A., **Gualtieri, L.**, Mark, B. G., Rojas, R., Rauch, E., Matt, D. T. (2021). Application of Axiomatic Design for the Development of Robotic Semi-and Fully Automated Assembly Processes: Two Case Studies. In 2021 International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME) (pp. 1-6). IEEE. DOI: 10.1109/ICECCME52200.2021.9590968
18. Rojas, R. A., Garcia, M. A. R., **Gualtieri, L.**, Rauch, E. (2021). Combining safety and speed in collaborative assembly systems–An approach to time optimal trajectories for collaborative robots. Procedia CIRP, 97, 308-312. DOI: https://doi.org/10.1016/j.procir.2020.08.003
19. Mark, B. G., **Gualtieri, L.**, De Marchi, M., Rauch, E., Matt, D. T. (2021). Function-based mapping of industrial assistance systems to user groups in production. Procedia CIRP, 96, 278-283. DOI: 10.1016/j.procir.2021.01.087
20. Rojas, R. A., Ruiz Garcia, M. A., **Gualtieri, L.**, Wehrle, E., Rauch, E., Vidoni, R. (2021). Automatic planning of psychologically less-stressful trajectories in collaborative workstations: An integrated toolbox for unskilled users. In ROMANSY 23-Robot Design, Dynamics and Control: Proceedings of the 23rd CISM IFToMM Symposium 23 (pp. 118-126). Springer International Publishing. DOI: https://doi.org/10.1007/978-3-030-58380-4_15
21. **Gualtieri, L.**, Rauch, E., Vidoni, R., Matt, D. T. (2020). Safety, ergonomics and efficiency in human-robot collaborative assembly: design guidelines and requirements. Procedia CIRP, 91, 367-372. DOI: https://doi.org/10.1016/j.procir.2020.02.188
22. **Gualtieri, L.**, Monizza, G. P., Rauch, E., Vidoni, R., Matt, D. T. (2020). From design for assembly to design for collaborative assembly-product design principles for enhancing safety, ergonomics and efficiency in human-robot collaboration. Procedia CIRP, 91, 546-552. DOI: https://doi.org/10.1016/j.procir.2020.02.212
23. Mark, B. G., **Gualtieri, L.**, Rauch, E., Rojas, R., Buakum, D., Matt, D. T. (2019). Analysis of user groups for assistance systems in production 4.0. In 2019 IEEE International Conference on Industrial Engineering and

Engineering Management (IEEM) (pp. 1260-1264). IEEE. DOI: 10.1109/IEEM44572.2019.8978907

24. **Gualtieri, L.**, Rauch, E., Vidoni, R., Matt, D. T. (2019). An evaluation methodology for the conversion of manual assembly systems into human-robot collaborative workcells. Procedia Manufacturing, 38, 358-366. DOI: https://doi.org/10.1016/j.promfg.2020.01.046.
25. Garcia, M. A. R., Rojas, R., **Gualtieri, L.**, Rauch, E., Matt, D. (2019). A human-in-the-loop cyber-physical system for collaborative assembly in smart manufacturing. Procedia CIRP, 81, 600-605. DOI: https://doi.org/10.1016/j.procir.2019.03.162.
26. **Gualtieri, L.**, Rojas, R., Carabin, G., Palomba, I., Rauch, E., Vidoni, R., Matt, D. T. (2018). Advanced automation for SMEs in the I4. 0 revolution: Engineering education and employees training in the smart mini factory laboratory. In 2018 IEEE international conference on industrial engineering and engineering management (IEEM) (pp. 1111-1115). IEEE. DOI: https://doi.org/10.1109/IEEM.2018.8607719.
27. **Gualtieri, L.**, Rauch, E., Rojas, R., Vidoni, R., Matt, D. T. (2018). Application of Axiomatic Design for the design of a safe collaborative human-robot assembly workplace. In MATEC Web of Conferences (Vol. 223, p. 01003). EDP Sciences. DOI: https://doi.org/10.1051/matecconf/201822301003.

Book chapters

28. **Gualtieri, L.**, Palomba, I., Wehrle, E. J., Vidoni, R. (2020). The opportunities and challenges of SME manufacturing automation: safety and ergonomics in human–robot collaboration. Industry 4.0 for SMEs: Challenges, opportunities and requirements, 105-144. DOI: https://doi.org/10.1007/978-3-030-25425-4_4
29. **Gualtieri, L.**, Rojas, R. A., Ruiz Garcia, M. A., Rauch, E., Vidoni, R. (2020). Implementation of a laboratory case study for intuitive collaboration between man and machine in SME assembly. Industry 4.0 for SMEs: Challenges, Opportunities and Requirements, 335-382. DOI: https://doi.org/10.1007/978-3-030-25425-4_12

Poster presentations

30. Brendel, H., Fraboni, F., **Gualtieri, L.**, Puzzo, G., Pietrantoni, L. (2023, May). Improving and Extending Design Guidelines for Human-Robot Collaboration in the Workplace. Poster Presentation at the Human Factors and Ergonomics Society – Europe Chapter Annual Meeting 2023, Liverpool, U.K, 26th -28nd April, 2023.
31. Fraboni, F., **Gualtieri, L.**, De Marchi, M., Puzzo, G., Pietrantoni, L., Rauch, E. (2022, April). An Experimental Study on Workstation Characteristics in Industrial Human-Robot Collaboration. Poster presentation at the Human Factors and Ergonomics Society – Europe Chapter Annual Meeting 2022, Turin, Italy, 20th -22nd April, 2022.
32. Panchetti, T., Fraboni, F., **Gualtieri, L.**, De Marchi, M., Pietrantoni L. (2022, April). An Eye Tracker Study on Cognitive Ergonomics in Human-

Robot Collaboration. Poster Presentation at the Human Factors and Ergonomics Society – Europe Chapter Annual Meeting 2022, Turin, Italy, 20th -22nd April, 2022.

33. Fraboni, F., **Gualtieri, L**., De Marchi, M., Pietrantoni, L. Rauch, E. (2022, January, Conference cancelled due to COVID-19 pandemic situation). Improving Workers' Perceived Enjoyment, Stress and Acceptance in Human-Robot Collaboration: An Experimental Study. Poster presentation at 20th EAWOP congress, Glasgow, Scotland, 11th – 14th January, 2022.

Dissertations

34. **Gualtieri, L**. (2021). Methodologies and Guidelines for the Design of Safe and Ergonomic Collaborative Robotic Assembly Systems in Industrial Settings. PhD dissertation. Available at https://www.researchgate.net/profile/Luca-Gualtieri.

Other publications (not indexed)

35. Rauch, E., **Gualtieri, L.**, Mark, B. G., De Marchi, M., Matt, D. T. Digitalization of Practical Laboratory Teaching in Learning Factories in the Age of Covid-19. European Professors of Industrial Engineering and Management, 36.

36. Fraboni, F., **Gualtieri, L.**, Panchetti, T. De Angelis, M., Puzzo, G., De Marchi, M., Pietrantoni, L. (2022). Carico di Lavoro Cognitivo nella Collaborazione Uomo-Robot: in che Modo le Funzionalità di Progettazione della Workstation Possono Migliorare l'Esperienza dei Lavoratori? XII Congresso Nazionale della Società Italiana di Ergonomia e Fattori Umani – SIE2022.

37. **Gualtieri, L.**, Fraboni, F., De Marchi, M., Rauch, E. (2022). Il Ruolo dell'Ergonomia Cognitiva nell'Interazione Uomo-robot nell'Industria: Uno Studio Preliminare. XII Congresso Nazionale della Società Italiana di Ergonomia e Fattori Umani – SIE2022, Lucca.

38. **Gualtieri, L.** (2020). Dal "Design for Assembly" al "Design for Collaborative Assembly". The Next Factory.

39. **Gualtieri, L.**. (2021). L'Industria 4.0 e la robotica collaborativa: legami e fondamenti. The Next Factory.

40. **Gualtieri, L.**. (2021). La sicurezza e la gestione del rischio meccanico nella robotica collaborativa industriale Parte 1 – Concetti di base. The Next Factory.

41. **Gualtieri, L.**. (2021). La sicurezza e la gestione del rischio meccanico nella robotica collaborativa industriale Parte 2 – Il panorama normativo. The Next Factory.

42. **Gualtieri, L.**. (2021). La sicurezza e la gestione del rischio meccanico nella robotica collaborativa industriale Parte 3 – La modellazione dei contatti uomo-robot. The Next Factory.

43. **Gualtieri, L.**. (2021). La sicurezza e la gestione del rischio meccanico nella robotica collaborativa industriale Parte 4 – Limitazione di Potenza e Forza. The Next Factory.

44. **Gualtieri, L.**. (2021). La sicurezza e la gestione del rischio meccanico nella robotica collaborativa industriale Parte 5 – Monitoraggio di velocità e distanza. The Next Factory.
45. **Gualtieri, L.**. (2022). La sicurezza e la gestione del rischio meccanico nella robotica collaborativa industriale Parte 6 – Misure per la riduzione del rischio meccanico nelle applicazioni collaborative. The Next Factory.
46. **Gualtieri, L.**. (2022). La transizione da sistema di produzione manuale a collaborativo: criteri per l'allocazione dei compiti tra uomo e robot. The Next Factory.
47. **Gualtieri, L.**. (2022). Robot collaborativi come sistemi di assistenza: principi e caso studio. The Next Factory.
48. **Gualtieri, L.**. (2022). Robotica collaborativa ed ergonomia cognitiva: principi e linee guida per i progettisti (parte 1). The Next Factory.
49. **Gualtieri, L.**. (2022) Robotica collaborativa ed ergonomia cognitiva: principi e linee guida per i progettisti (parte 2). The Next Factory.
50. **Gualtieri, L.** (2023). Sviluppi futuri della robotica collaborativa in ottica "Industria 5.0". The Next Factory.
51. Vidoni, R., **Gualtieri, L.**, Giusti, A. (2023, April). Collaborazione Uomo-Robot - Serie Impresa 4.0 (parte 1): Automazione flessibile per le PMI attraverso i robot collaborativi. Camera di Commercio, Industria e Artigianato di Bolzano. Articoli specializzati. https://www.handelskammer.bz.it/it/servizi/digitalizzazione/conoscenze-pratiche/articoli-specializzati/collaborazione-uomo-robot-serie-impresa-40-parte-1
52. **Gualtieri L.** (2023, April). Rauch, E. Digital Twin e Simulazione – Parte 2: Modellazione digitale e simulazione nella produzione e nella logistica. Camera di Commercio, Industria e Artigianato di Bolzano. Articoli specializzati. https://www.handelskammer.bz.it/it/servizi/digitalizzazione/conoscenze-pratiche/articoli-specializzati/digital-twin-e-simulazione-%E2%80%93-parte-2
53. **Gualtieri, L**. 2021. Fundamentals of occupational safety in industrial human-robot interaction. Smart Human Oriented Platform for Connected Factories (SHOP4CF). https://learn.shop4cf.eu/courses/course-v1:SHOP4CF+S4CF03+2022/about

Awards

Outstanding Paper Award (as first author) at IEEM 2018 (Bangkok, Thailand) with the paper: Advanced Automation for SMEs in the I4.0 Revolution: Engineering Education and Employees Training in the Smart Mini Factory Laboratory (Luca Gualtieri, Rafael Rojas, Giovanni Carabin, Ilaria Palomba, Erwin Rauch, Renato Vidoni, Dominik Matt).

Oral contribution at national and international conferences

1. **IPEC 2023** – Participation as invited speaker at the International Production Environmental Community conference (section "Human-Centered Production") (IPEC 2023), organized online, 8th March 2023. Title of the presentation "Future Design of Human-Centered Collaborative Assembly Workstations for the Improvement of Operators' Ergonomics and Production Efficiency".

2. **SIE 2022** – Participation as speaker at the XII Congresso Nazionale Società Italiana di Ergonomia e Fattori Umani (SIE 2022), organized in hybrid form, Lucca (Italy), 2-4 May 2022. Presentation of the paper: Gualtieri, L., Fraboni, F., De Marchi, M., Rauch, E., 2022, "Il Ruolo dell'Ergonomia Cognitiva nell'Interazione Uomo-robot nell'Industria: Uno Studio Preliminare".

3. **ICECCME 2021** – Participation as speaker at the International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME 2021), organized in hybrid form, Mauritius, 7-8 October 2021. Presentation of the paper: Merati, F. A., Gualtieri, L., Mark, B. G., Rojas, R., Rauch, E., Matt, D. T., 2021, "Application of Axiomatic Design for the Development of Robotic Semi-and Fully Automated Assembly Processes: Two Case Studies", DOI: 10.1109/ICECCME52200.2021.9590968.

4. **IEA 2021** – Participation as speaker at the 21th Triennial Congress of the International Ergonomics Association (IEA 2021), organized online, Vancouver (Canada), 14-18 June 2021. Presentation of the paper: Gualtieri, L., Fraboni, F., De Marchi, M., Rauch, E., 2022, "Evaluation of variables of cognitive ergonomics in industrial human-robot collaborative assembly systems", DOI: https://doi.org/10.1007/978-3-030-74614-8_32.

5. **CIRP Design 2020** – Participation as speaker at the 30th CIRP Design Conference (CIRP Design 2020), organized online, South Africa, 5-8 May 2020. Presentation of the paper: Gualtieri, L., Monizza, G. P., Rauch, E., Vidoni, R., Matt, D. T. "From design for assembly to design for collaborative assembly-product design principles for enhancing safety, ergonomics and efficiency in human-robot collaboration", 2020, DOI: https://doi.org/10.1016/j.procir.2020.02.212.

6. **CIRP Design 2020** – Participation as speaker at the 30th CIRP Design Conference (CIRP Design 2020), organized online, South Africa, 5-8 May 2020. Presentation of the paper: Gualtieri, L., Rauch, E., Vidoni, R., Matt, D. T., 2020, "Safety, ergonomics and efficiency in human-robot collaborative assembly: design guidelines and requirements", DOI: https://doi.org/10.1016/j.procir.2020.02.188.

7. **FAIM 2019** – Participation as speaker at the 29th Flexible Automation and Intelligent Manufacturing (FAIM 2019), Limerick (Ireland), 24-28 June 2019. Presentation of the paper: Gualtieri, L., Rauch, E., Vidoni, R., Matt, D. T., 2019, "An evaluation methodology for the conversion of manual assembly systems into human-robot collaborative workcells", DOI: https://doi.org/10.1016/j.promfg.2020.01.046.

8. **ICAD 2018** – Participation as speaker at the 12th International Conference on Axiomatic Design (ICAD 2018), Reykjavík (Iceland), 9-12 October 2018. Presentation of the paper: Gualtieri, L., Rauch, E., Rojas, R., Vidoni, R., Matt, D. T., 2018, "Application of Axiomatic Design for the design of a safe collaborative human-robot assembly workplace", DOI: https://doi.org/10.1051/matecconf/201822301003.

Invited talks

Keyonote presentations

- Invited Keynote speaker for the "Irish Human Factors & Ergonomics Society Annual Conference 2023: Human Factors in The Era of Digital Transformation" (IHFES 2023), Dublin, 12th June 2023. Title of the presentation: "Managing mechanical safety in industrial Human-Robot Interaction".

Scientific and convention presentations

- "Future Design of Human-Centered Collaborative Assembly Workstations for the Improvement of Operators' Ergonomics and Production Efficiency" at the "International Production Environmental Community" conference (IPEC2023), section "Human-Centered Production", online conference, 8th March 2023.
- "Linee guida per il miglioramento dell'ergonomia cognitiva nella progettazione di sistemi di assemblaggio collaborativo uomo-robot" at the convention "Ergonomia nei processi produttivi. Dentro ed oltre la direttiva macchine tra compliance e valore competitivo" organized by SIE (Società Italiana di Ergonomia e Fattori Umani), Ambiente e Lavoro fair, 1st December 2021.
- "Flexible Automation through Human-Robot Collaboration to Enhance Ergonomics and Performance in Industrial Assembly: a Case Study" (distinguished speaker) at the "Automation, MES and Manufacturing 4.0" session of the 4th European Conference on Industrial Engineering and Operations Management, 4th August 2021.
- "Development of a collaborative assembly workstation: a case study about wire harness assembly" at the SME 4.0 annual meeting scientific presentations, Technicom, 20th February 2020.
- "Industria 4.0: robot collaborativi (cobots) da un punto di vista della sicurezza" at the "Sicurezza e salute, obbligo o cultura?" international convention about occupational health and safety organized by CPE Comitato Paritetico Edile, Free University of Bozen-Bolzano, 2th September 2019.

Seminar and webinar presentations

- "Tecnologie industriali avanzate a supporto dei lavoratori: opportunità e rischi" (webinar) organized by the Società Italiana di Ergonomia e Fattori Umani, 17th May 2023.
- "Human robot collaboration in manufacturing 4.0" (seminar) at University of Modena e Reggio Emilia, Italy, 11st October 2022.
- "Safety in Industrial Human-Robot Interaction" in the course Industrial Robotics Praktikum at Technical University of Munich (TUM), 22th September 2021.
- "Gli aspetti di sicurezza nella robotica collaborativa industriale" at the Web Marketing Festival - Il più grande Festival sull' Innovazione Digitale e Sociale, Robotics room, 19th November 2020.
- "Ergonomia e robotica collaborativa industriale" at the Advanced Collaborative Robotics webinar organized by Assindustria Venetocentro and Fraunhofer Italia, 13th July 2020.

- "Introduzione agli aspetti di sicurezza nella robotica collaborativa industriale" at the Advanced Collaborative Robotics webinar organized by Assindustria Venetocentro and Fraunhofer Italia, 22th June 2020.
- "Robotica Collaborativa" (seminar) at Smart Mini Factory Lab, Free University of Bozen-Bolzano, Italy, 21th September 2018.

Workshop presentations

- "Design of human centered collaborative assembly systems: the Wirecobots project" at International Conference on Intelligent Robots and Systems (IROS), 27th September 2021.
- "Experience Lab | AI applicata alla produzione" at the Artificial Intelligence and Machine Learning event, SMACT competence center, Portogruaro, Italy, 2 July 2021.
- "L'integrazione degli aspetti di sicurezza, ergonomia ed efficienza nel processo di trasformazione da stazioni di assemblaggio manuale a collaborative" at the "Workshop on Safety and Ergonomics for Industrial Collaborative Workspaces", Free University of Bozen-Bolzano, January 31th 2020.
- "Industria 4.0 - la trasformazione digitale nella fabbrica intelligente" at the "Digital Enterprise 365" event organized by EOS Solutions, Castel Mareccio, October 17th 2019.
- "Safety and Ergonomics in Industrial Human-Robot Collaboration" at the 2nd PostgradXchange International Workshop on Logistics and Industry 4.0, Faculty of Industrial Engineering, Chiang Mai University, Thailand, November 29th 2018.

Organization of workshops and conferences

- **Organizazion co-chair** for the tutorial workshops at the 15th International Conference on Axiomatic Design - ICAD2023 (https://www.axiomaticdesign.org/icad).
- **Workshop and organization chair** "Workshop on Industrial Collaborative Robots: Design of Safe Applications and Programming" organized by the Free University of Bozen-Bolzano in collaboration with the University of Udine and Homeberger spa, January 11-13, 2023.
- **Conference organization co-chair** of the 1st International Symposium on Industrial Engineering and Automation - ISIEA2022 (https://isiea.events.unibz.it/), Free University of Bozen-Bolzano, June 20-23, 2022.
- **Workshop and organization chair** "Bilateral Workshop on smart and sustainable engineering technologies", between Free University of Bozen-Bolzano (Italy) and Chiang Mai University (Thailand), 11th November, 2021.
- **Workshop and organization chair** "Bilateral Workshop on the design of smart manufacturing systems", online event between Free University of Bozen-Bolzano (Italy) and Purdue University Fort Wayne (USA), 30th September, 2021.

Session and panel chairmanships

- **Session Chair** "Automated Factories and Robots" 3rd International Conference on Industry 4.0 and Smart Manufacturing (ISM), Hagenberg/Linz (Austria), November, 17-19 2021.

- **Outstanding panel chair** for the section "Industry Solutions and Industry 4.0" at the First Asia Pacific Conference on Industrial Engineering and Operations Management (IEOM Society), Harbin, China, July 9-11, 2021. Title of the panel: "Human-centered manufacturing in Industry 4.0".
- **Session Chair** "Collaborative Robotics in Smart Manufacturing 2" 29th international conference on Flexible Automation and Intelligent Manufacturing (FAIM), Limerick (Ireland), June 24-28, 2019.

Other third mission activities

- **Collaborator** for the development of teaching materials and courses regarding industrial collaborative robotics for "ISDI Accelerator" (https://accelerator.isdi.education/), project "Smart Human Oriented Platform for Connected Factories" (SHOP4CF - https://learn.shop4cf.eu/courses)
- **Collaborator** for the development of teaching materials and courses regarding industrial collaborative robotics for "Lean Experience Factory 4.0" (https://lef-digital.com/profilo/);
- **Collaborator and author** for the magazines "The Next Factory" (https://www.thenextfactory.it/) and "Tecnologie Meccaniche" (https://www.techmec.it/) for the writing of technical articles regarding Industry 4.0 and collaborative robotics.
- **Author** of informative articles about Industry 4.0 technologies for the Chamber of commerce, industry, crafts and agriculture of Bolzano (Italy) (https://www.camcom.bz.it/it/servizi/digitalizzazione/conoscenze-pratiche/articoli-specializzati).
- **Officer** for the management of the Linkedin webpage of the "Master in Industrial Mechanical Engineering" of the Free University of Bozen-Bolzano.
- **Cordinator** of several (high-school, BSc and MSc) students and company visits to the Smart Mini Factory laboratory of the Free University of Bozen-Bolzano. Some recent and relevant examples are (2023): SMF lab presentation for the Copbund (Unione Cooperative Alto Adige) the 20th of March 2023; Coordinator and presenter for the SMF lab online presentation (project SME5.0) with Universidad del Salvador (more than 250 students participated) the 20th of April 2023; Coordinator and presenter for the unibz Bachelor Day visit to the SMF the 6th of May 2023.
- **Didactic support and practical demonstration** of the application of collaborative robotics in various events, visits and seminars for high school students, students as well as professionals from the industry in the Smart Mini Factory laboratory.

Visiting activities

- **(2018) Visiting researcher at Chiang Mai University** (Thailand) within the research project "SME 4.0 – Industry 4.0 for SMEs" (EU-H2020). Collaboration with the research group "Excellence Center in Logistics and Supply Chain Management (E-LSCM)" for the analysis of the requirements and the design of Industry 4.0-based adaptable manufacturing systems for SMEs. Period: November 2018 – December 2018.
- **(2018) Visiting researcher at the company ELCOM sro** within the research project "SME 4.0 – Industry 4.0 for SMEs" (EU-H2020). Collaboration with the company ELCOM sro and the "Faculty of Manufacturing Technologies" of the Technical University of Košice for the

preliminary analysis of the potentials for collaborative robotics in the company's manual processes. Period: August 2018 – September 2018.

- **(2019) Visiting researcher at Chiang Mai University** (Thailand) within the research project "SME 4.0 – Industry 4.0 for SMEs" (EU-H2020). Collaboration with the research group "Excellence Center in Logistics and Supply Chain Management (E-LSCM)" for the identification of potentials for automation and human-robot interaction in SMEs. Period: October 2019 – December 2019.
- **(2019) Visiting researcher at the company ELCOM sro** within the research project "SME 4.0 – Industry 4.0 for SMEs" (EU-H2020). Collaboration with the company ELCOM sro and the "Faculty of Manufacturing Technologies" of the Technical University of Košice for the identification of theoretical models for human-robot task allocation in the company's manual processes. Period: June 2019.
- **(2019) Visiting researcher at the company ELCOM sro** within the research project "SME 4.0 – Industry 4.0 for SMEs" (EU-H2020). Collaboration with the company ELCOM sro and the "Faculty of Manufacturing Technologies" of the Technical University of Košice for the discussion and presentation of the final results of the use company's use case. Period: February 2020.

Supervision of thesis and internships

Master Thesis

1. **Co-supervisor for the Master Thesis** "Augmented Reality to support operator training in industry", student Oehler Maximilian, Free University of Bozen-Bolzano. Academic year 2022-2023.
2. **Co-supervisor for the Master Thesis** "Validation of Cognitive Ergonomics in Industrial Human-Robot Collaboration", student Matteo De Marchi, Free University of Bozen-Bolzano. The thesis led to a conference paper publication. Academic year 2019-2020.
3. **Co-supervisor for the Master Thesis** "Simulation-based development of semi- and fully automated assembly processes", student Fabio Merati, Free University of Bozen-Bolzano. The thesis led to a conference paper publication. Academic year 2019-2020.
4. **External examiner for the Master Thesis** "Safety 4.0 for Collaborative Robotics in the Factories of the Future", student Caruana Luca, Faculty of Engineering, University of Malta. Academic year 2021-2022.

Bachelor thesis

5. **Supervisor for the Bachelor Thesis** "Industry 5.0 assistive technologies for the inclusion of disabled people in manufacturing workplaces", student Lucchi Thomas, Free University of Bozen-Bolzano. Academic year 2023-2024.
6. **Co-supervisor for the Bachelor Thesis** "Simulation-Supported Ergonomics Analysis of Assembly Processes Using Virtual Process and Human Modeling", student Pezzano Alessia, Free University of Bozen-Bolzano. Academic year 2020-2021.
7. **Co-supervisor for the Bachelor Thesis** "The Role of Collaborative Robotics in the South-Tyrolean Industry: a Field Study", student

Gianpietro Guatelli, Free University of Bozen-Bolzano. Academic year 2018-2019.

Intenships

8. **Co-supervisor** for the compulsory internship at the company Athesia Druck, student Paioletti Lamberto, Free University of Bozen-Bolzano. Academic year 2022-2023.

National and international collaborations

In the following, the main research groups with which the collaboration was/is more active are listened (leaving out other contacts related to national and international projects, as well as editorial and associations contacts).

National institutions

1. "X in the loop Simulation Lab" of the Department of Engineering, University of Modena and Reggio Emilia (Italy) – Prof. Peruzzini, Dr. Grandi. Collaboration about the topics of digital and simulation tools for physical ergonomics in production and advanced human-machine interaction;

2. "Human Factors, Risk and Safety" research unit of the Department of Psychology, University of Bologna (Italy) – Prof. Pietrantoni, Dr. Fraboni. Collaboration about the topics of safety and ergonomics in anthropocentric human-robot interaction;
3. "Società Italiana di Ergonomia e Fattori Umani", scientific and professional association (Italy) – Dr. Gilotta, Dr. Fraboni. Collaboration about the topics of ergonomics in Industry 4.0-based production processes;

4. "Automation and Mechatronics Engineering" group of the Fraunhofer Italia Research (Italy) – Dr. Riedl, Dr. Giusti. Collaboration about the topics of safety and ergonomics in anthropocentric human-machine interaction;

5. "Institute of Intelligent Industrial Technologies and Systems for Advanced Manufacturing", Consiglio Nazionale delle Ricerche (Italy) – Dr. Valori. Collaboration about the topics of safety and ergonomics in intelligent human-machine interaction;
6. "Industrial Design Laboratory" of the Department of Engineering, University of Modena and Reggio Emilia (Italy) – Dr. Pini. Collaboration about the topic of engineering education in the field of safety in industrial collaborative robotics;
7. "Marconi Industry 4.0 – Innovation Training Lab" of the Department of Engineering Sciences, University Guglielmo Marconi (Italy) – Prof. Arcidiacono. Collaboration about the topic of engineering education in the field of design of complex production systems;
8. "Polytechnic Department of Engineering and Architecture" of the University of Udine (Italy) – Dr. Scalera. Collaboration about the topic of engineering education in the field of industrial collaborative robotics applications;

9. "Centro Ricerche Fiat", Stellantis group (Italy) – Ing. Di Pardo, Ing. Zanella. Collaboration about the topic of physical assistance systems in production;

International institutions

10. "Department of Industrial and Manufacturing Engineering" of the Faculty of Engineering, L-Università ta' Malta (Malta) – Prof. Francalanza. Collaboration about the topics of engineering education in the field of safety in industrial collaborative robotics and advanced human-machine interaction;
11. "Istituto Dalle Molle di studi sull'Intelligenza Artificiale" of the Scuola Universitaria Professionale della Svizzera Italiana, Università della Svizzera italiana (Switzerland) – Dr. Roveda. Collaboration about the topics of safety and ergonomics in intelligent human-machine interaction;
12. "Center of Excellence in Logistics and Supply Chain Management" of the Faculty of Engineering, Chiang Mai University (Thailand) – Prof. Korrakot Yaibuathet. Collaboration about the topic of Industry 4.0 technology requirements for SMEs;
13. "Human Factors and Ergonomics" research group, Federal Institute for Occupational Safety and Health (Germany) – Dr. Helen Rosen. Collaboration about the topics of human-factors and ergonomics in advanced human-machine interaction;
14. "Center of Excellence in Systems Engineering" of the Purdue University (USA) – Prof. Cohran. Collaboration about the topic of engineering education in the field of design of complex production systems;
15. "Human Centered Cyber Physical Production and Assembly Systems" research group of the Institute of Management Science, Technical University of Wien (Austria) – Dr. Fischer, Prof. Schlund. Collaboration about the topic of collaborative robotic assembly systems design;
16. "Virtual Engineering Research Centre" of the School of Engineering and Science", University of Skövde (Sweden) – Prof. Thorvald, Prof. Billing. Collaboration about the topic of cognitive ergonomics in advanced human-machine interaction;
17. "Human Factors in Safety and Sustainability" research Group of the Food Science & Environmental Health school, Technical University Dublin (Ireland) – Prof. Leva. Collaboration about the topic of engineering education in the field of safety and ergonomics in industrial collaborative robotics;
18. "Faculty of Manufacturing Technologies" of the Technical University of Košice (Slovakia) – Prof. Modrak, Dr. Soltysová. Collaboration about the topic of Industry 4.0 technology requirements for SMEs;
19. "Institute for Robotics and Mechatronics" of the Joanneum Research institute (Austria) – Prof. Hofbaur, Dr. Rathmair. Collaboration about the topics of safety and risk assessment in collaborative robotics assembly systems;
20. "Chair of Production Systems" Of the Faculty of Mechanical Engineering, University of Bochum (Germany) – Prof. Kuhlenkötter, Dr. Miro, Prof. Kuhlenkötter. Collaboration about the topics digital twin-based mobile robotics for ergonomic building maintenance;
21. "Center for Production, Robotics and Automation" of the Entrepreneurial School MCI (Austria) – Dr. Massow. Collaboration about the topic of industrial robotics applications in smart production systems;

22. "Business Organization Department" of the Faculty of Engineering Vitoria-Gasteiz, University of the Basque Country (Spain) – Dr. de la Torre Collaboration about the topics of engineering education in the field of digital and simulation tools for human-centered design of production systems;
23. "The Irish Human Factors & Ergonomics Society" organization of professional people (Ireland) – Prof. Leva. Collaboration about the topic of engineering education in the field of safety and ergonomics in industrial collaborative robotics;
24. "Department of Mechanical & Materials Engineering" of the Worcester Polytechnic Institute (USA) – Prof. Brown. Collaboration about the topic of engineering education in the field of design of complex production systems;
25. "Institute for Scientific and Technological Research" of the Faculty of Engineering, Universidad del Salvador (Argentina) – Prof. Salimbeni. Collaboration about the topic of engineering education in the field of Industry 4.0;

Companies

26. GlobalWafers MEMC Electronic Materials spa – Ing. Odorizzi. Collaboration about the topic of augmented reality-based training for complex machinery set-up;
27. Carretta srl – Sig. Ghedin. Collaboration about the topic of collaborative robotic assembly systems design;
28. Homberger spa – Sig. Ossola. Collaboration about the topic of collaborative robotic assembly systems design;
29. Smart Robots srl – Ing. Cividini. Collaboration about the topic of artificial intelligence-based assistance systems for ergonomic manufacturing processes;
30. DuKa spa – Ing. Theo Rabanser. Collaboration about the topic of process automation for smart production;
31. Durst spa – Sig. Rath. Collaboration about the topic of process automation for smart production;
32. Leitner spa – Ing. Schenk. Collaboration about the topic of predictive maintenance of industrial plants.
33. Prostahl srl – Ing. Mattiello. Collaboration about the topic of industrial robotics applications in smart production systems;
34. Novum2 – Sig. Mazzurana. Collaboration about the topic of technology-based social inclusion of disabled workers in production;
35. MeKo srl – Sig. Cal. Collaboration about the topic of collaborative robotic assembly systems design;
36. Elcom sro – Ing. Lapos. Collaboration about the topic of Industry 4.0 technology requirements for SMEs;

Professional experience in designing production systems

For further details, please refer to the section "National and international projects participation".

Development of Augmented Reality-based worker's assistance and training systems (2022-2023)

During the activities foreseen by the commissioned projects "AR-CO" and "AR-CO-2", I supported (i) the development of AR-based innovative training modalities to support unskilled operators in understanding complex assembly systems and machinery, (ii) the integration of Visual Management tools and AR technology to enhance the operator's training efficacy, and (iii) the study of solutions for AR-based smart data visualization and management for the reduction of system's assembly errors and the enhancement of production performances (e.g. time and flexibility).
Related publications:

- Gualtieri, L., Revolti, A., Dallasega, P. (2023). Training support with Augmented Reality for Machine Setup: A Case Study in the Process Industry. Letures Notes in Networks and Systems. (Accepted paper).
- Gualtieri, L., Revolti, A., Dallasega, P. (2023). A human-centered conceptual model for integrating Augmented Reality and Dynamic Digital Models to reduce occupational risks in industrial contexts. Procedia Computer Science, 217, 765-773. DOI: https://doi.org/10.1016/j.procs.2022.12.273.

Development of guidelines for the design of ergonomic and intelligent human-machine interaction in industrial contexts (2022-2023)

During the activities foreseen by the project "Sestosenso" (Physical Intelligence for Smart and Safe Human-Robot Interaction), I supported (i) the design of a common framework for the definition and preliminary validation of design guidelines for production workplaces, and (ii) the development of technical guidelines to support non-experts in safety and ergonomics in designing anthropocentric production systems based on collaborative robotics.
Related publications:

- Gualtieri, L., Fraboni, F., Brendel, H., Dallasega, P., Rauch, E. Pietrantoni, L. (2023). Guidelines for the integration of cognitive ergonomics in the design of human-centered and collaborative robotics applications. Procedia CIRP. (Accepted paper).
- Panchetti, T., Pietrantoni, L., Puzzo, G., Gualtieri, L., Fraboni, F. (2023). Assessing the Relationship between Cognitive Workload, Workstation Design, User Acceptance and Trust in Collaborative Robots. Applied Sciences, 13(3), 1720. DOI: https://doi.org/10.3390/app13031720. Scopus indexed (Quartile 2).

Development and optimization of automation concepts (2021-2022)

During the activities foreseen by the project "DURST-1" and "GW-1", I supported (i) the definition of automation concepts for products assembly process and quality inspection, and (ii) the simulation for concurrent process design and optimization.

Design and implementation of human-centered collaborative assembly systems starting from manual processes (2019-2020)

During the activities foreseen by the project "Wirecobots – ESMERA" (European SMEs Robotics Applications), I supported (i) the development of a new methodology for the assessment of the potential for the use of collaborative robots as physical assistance systems in production, and (ii) the

development of a methodology for the ergonomic design of advanced collaborative robotics systems and related logics for human-machine task allocation;
Related publications:

- Palomba, I., Gualtieri, L., Rojas, R., Rauch, E., Vidoni, R., Ghedin, A. (2021). Mechatronic re-design of a manual assembly workstation into a collaborative one for wire harness assemblies. Robotics, 10(1), 43. DOI: https://doi.org/10.3390/robotics10010043. Scopus indexed (Quartile 1).
- Gualtieri, L., Palomba, I., Merati, F. A., Rauch, E., Vidoni, R. (2020). Design of human-centered collaborative assembly workstations for the improvement of operators' physical ergonomics and production efficiency: A case study. Sustainability, 12(9), 3606. DOI: https://doi.org/10.3390/su12093606. Scopus indexed (Quartile 2).
- Merati, F. A., Gualtieri, L., Mark, B. G., Rojas, R., Rauch, E., Matt, D. T. (2021). Application of Axiomatic Design for the Development of Robotic Semi-and Fully Automated Assembly Processes: Two Case Studies. In 2021 International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME) (pp. 1-6). IEEE. DOI: 10.1109/ICECCME52200.2021.9590968

Development of measures for safety validation in human-robot interaction (2019-2020)

During the activities foreseen by the project "CoHoMe" (Comparison and Homogenization Of Safety Measurements), I supported (i) the development of a methodology for the comparison and homogenization of safety measurements between different collaborative robotics applications.
Related publications:

- Gualtieri, L., Rauch, E., Vidoni, R. (2022). Development and validation of guidelines for safety in human-robot collaborative assembly systems. Computers & Industrial Engineering, 163, 107801. DOI: https://doi.org/10.1016/j.cie.2021.107801. Scopus indexed (Quartile 1).

Simulation-based design of patient flow into the hospital emergency department (2019)

During the activities foreseen by the commissioned project "SIM-EH-BZ", I supported (i) the simulation of several scenarios for the optimization of the current situation of the emergency department of the Bolzano Hospital based on data analysis, (ii) the validation of the data framework through a discrete event simulation of the modeled situation.

Development of smart robot programming for customizable manufacturing operations (2018-2019)

During the activities foreseen by the commissioned project "Prohstahl", I supported (i) the definition of a model for defining the potential for process automation by analyzing manual manufacturing processes, and (ii) the development and test of a smart robot programming for customizable welding and grinding operations.

Relevant courses attendance

- "Siemens Process Simulate Robotics" (19-20.03.2020 – Siemens PLM Software.
- "Le posture di lavoro incongrue" (06.09.2019 – International Ergonomics School EPM-IES).

- "La progettazione e riprogettazione ergonomica del lavoro nella nuova normativa internazionale: direttive e standard ergonomici" (4-5-10.07.2019 – International Ergonomics School EPM-IES).
- "La movimentazione manuale di carichi: la valutazione del rischio con la formula del NIOSH per compiti semplici e multipli, il trasporto (NORME ISO e CEN)" (20-21.06.2019 – International Ergonomics School EPM-IES).
- "La valutazione del rischio da movimenti e sforzi ripetuti degli arti superiori: la Checklist OCRA e la mappatura del rischio" (09-10-15.05.2019 – International Ergonomics School EPM-IES).
- Summer School on Axiomatic Design (17-19.07.2018 – Free University of Bolzano, Bolzano).
- "Le isole robotizzate. Applicazione della norma UNI EN ISO 10218-2 (19.06.2018 – UNI Ente Italiano di Normazione).
- "Core and advanced training Universal Robot" (07.06.2018 – Me.Kosrl).
- "Dispositivi di protezione delle macchine Applicazione pratica delle norme EN ISO 13857, EN ISO 14119 e EN ISO 14120" (11.04.2018 – TUV INTERCERT).
- "Il rischio stress lavoro correlato" (21.02.2018 – Provincia Autonoma di Bolzano - Istituto Formazione Professionale).
- "Robotica collaborativa: novità ed applicazione della specifica tecnica ISO/TS 15066" (29.01.2018 UNI Ente – Italiano di Normazione).
- "Corso per la qualificazione dei formatori per la sicurezza sul lavoro con esame finale" (19.04.2017 – Provincia Autonoma di Bolzano - Istituto per la Formazione Professionale).
- "Modulo C per Responsabili del Servizio di Prevenzione e Protezione (RSPP) con verifica di apprendimento" (25.05.2016 – Provincia Autonoma di Bolzano - Istituto Formazione Professionale).

Professional certification and qualifications

- **Occupational Health and Safety Manager certification** (RSPP) released by the Institution for Professional Training in Bolzano, Alto Adige (valid from 2016 to 2026);
- **Occupational Health and Safety Trainer certification** released by the Institution for Professional Training in Bolzano, Alto Adige (valid from 2017 to 2023).

Further data

Computer skills and competences

- Good knowledge of Operating Systems, Word Processing and Data Sheet applications;
- Good knowledge of software "Siemens Tecnomatix Process Simulate".
- Good knowledge of Universal Robot (polyscript) programming;
- Good knowledge of 3D mechanical modeling software "Autodesk Inventor";
- Good knowledge of e-learning didactical content development software "ExeLearning";
- Good knowledge of health and safety management software "Alfagest";
- Good knowledge of Axiomatic Design evaluation software "Acclaro DFSS";
- Basic knowledge of manufacturing process simulation software "Flexim";

- Basic knowledge of software "Maple";
- Basic knowledge of software "Matlab";
- Basic knowledge of software "ABB Robotics";

Acquired skills

- Intermediate skills in the design and management of industrial machines by the Safety of Machinery European Directive;
- Intermediate skills in the management of occupational health and safety in industrial workplaces;
- Intermediate skills in the evaluation and design of ergonomic industrial workplaces;
- Intermediate skills in the simulation of robotic and manual processes in Process Simulate virtual environment;
- Intermediate skills in Universal Robot programming;
- Intermediate skills in the development of E-learning and Blended learning courses for technical training;
- Intermediate skills in the management of international educational projects for industrial engineering applications;
- Intermediate skills in technical training;

Language competence and certifications

Italian: mother tongue;

German: B1 - OSD Certificate for German Language;

English: B2 - Cambridge FCE.

Place and Date

Bolzano, 10.05.2023

I declare, pursuant to art. 76 of Presidential Decree 445/2000, that the information is true. I authorize the processing of my personal data in accordance with Legislative Decree 30 June 2003, n. 196 "Code for the protection of personal data" and the GDPR 679/16 - "European Regulation on the protection of personal data".