

CURRICULUM VITAE

30/06/2024



Francesco GHERARDINI

PERSONAL DETAILS

First name	Francesco
Last name	Gherardini
Nationality	Italian
Current Position	November 18, 2022 – present: Associate Professor (art. 24 comma 5, Legge 30.12.2010, n. 240), full time, in Design Methods for Industrial Engineering at the Department of Engineering “Enzo Ferrari”/Laboratory of Integrated Design and Engineering Applications, University of Modena and Reggio Emilia (UNIMORE)
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ORCID ID	0000-0002-9275-4314
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WoS ResearcherID	Q-8046-2019

EDUCATION

04/04/2011: **PhD in Simulation and Mechanical Design Methods** at the PhD School in “Advanced Mechanics and Vehicle Technology” of the Faculty of Engineering of Modena of the University of Modena and Reggio Emilia (XIII cycle). Thesis: Methods for the development of virtual prototypes for the integrated design and simulation of new industrial product development.

16/02/2006: **Master’s Degree in Mechanical Engineering**, University of Modena and Reggio Emilia, Thesis: Methodology for the integration of Design of Experiments and injection moulding simulation for the optimization of technopolymer components.

PREVIOUS POSITIONS

November 18, 2019 – November 17, 2022: **Researcher/assistant professor** (with a fixed-term contract, tenure track position) at the Department of Engineering “Enzo Ferrari”/Laboratory of Integrated Design and Simulation, University of Modena and Reggio Emilia (UNIMORE)

May 08, 2017 – November 17, 2019: **Researcher/assistant professor** (with a fixed-term contract, non-tenure track position) at the Department of Engineering “Enzo Ferrari”/Laboratory of Integrated Design and Simulation, University of Modena and Reggio Emilia (UNIMORE)

October 16, 2016 – May 07, 2017: **Post-doc Research fellow** at the Department of Engineering “Enzo Ferrari”/Laboratory of Integrated Design and Simulation, University of Modena and Reggio Emilia. Title of fellowship: Development and application of engineering methods in CAx platform for the functional and aesthetical development of industrial products, in particular for the automotive field.

September 16, 2015 – September 15, 2016: **Post-doc Researcher** (Grant from SIR spa) at the Department of Engineering “Enzo Ferrari”/Laboratory of Integrated Design and Simulation, University of Modena and Reggio Emilia. Title of grant: Mechanical design and tolerance analysis using CAT software in industrial robotics.

July 01, 2014 – June 30, 2015: **Post-doc Researcher** (Grant from HPE srl – COXA spa) at the Department of Engineering “Enzo Ferrari”/Laboratory of Integrated Design and Simulation, University of Modena and

Reggio Emilia. Title of grant: Mechanical design and tolerance analysis using CAT software in the automotive field.

March 15, 2011 – March 14, 2014: **Research collaborator** at the Interdepartmental Centre InterMech - Mo.Re. of the Technopole of Modena - Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia.

January 01, 2008 – December 31, 2010: **PhD Student** (Grant from the Italian Ministry of Education) at the PhD School in “Advanced Mechanics and Vehicle Technology” of the Faculty of Engineering of Modena of University of Modena and Reggio Emilia (XIII cycle). Title of research: Methods for the development of virtual prototypes for the integrated design and simulation of new industrial product development.

April 2007 – October 2007: **Research collaborator** at the Department of Engineering “Enzo Ferrari”/Laboratory of Integrated Design and Simulation, University of Modena and Reggio Emilia. Title of research: Activity of integrated design and simulation for new product development

April 16, 2006 – April 15, 2007: **Research fellow** at the Department of Mechanical and Civil Engineering/Laboratory of Integrated Design and Simulation, University of Modena and Reggio Emilia. Title of fellowship: Robust engineering methods for the integrated design of technopolymer components.

TEACHING ACTIVITY

Computer-Aided Design, Bachelor Degrees in Mechanical and Vehicle Engineering (University of Modena and Reggio Emilia): from A.Ys. 2017-18 to present.

Design Methods, Master’s Degree in Vehicle Engineering (University of Modena and Reggio Emilia): from A.Ys. 2018-2019 to present.

Industrial Technical Drawing, Bachelor Degrees in Mechanical and Vehicle Engineering (University of Modena and Reggio Emilia): A.Ys. 2023-24, 2017-18, 2016-17, 2010-11.

Computer-Aided Drafting, Bachelor Degree in Civil and Environmental Engineering (University of Modena and Reggio Emilia): from A.Ys. 2015-16 to present.

Architectural/civil drawing and CAD, Bachelor Degrees in Environmental and Workplace Accident Prevention Techniques (University of Trento): A.Ys. 2018-19, 2017-18, 2016-17, 2015-16, 2014-15; and in Construction and Land Management (University of the Republic of San Marino): A.Y. 2016-2017

3D CAD Modelling, Bachelor Degree in Occupational Therapy (Medicine - University of Modena and Reggio Emilia): from A.Ys. 2017-18 to present.

Assistant instructor in the course **Technical drawing and Computer-Aided Design**, Bachelor Degrees in Mechanical, Aerospace, and Energy Engineering (Polytechnic University of Milan): A.Ys. 2015-2016, 2014-2015.

RESEARCH ACTIVITY

My research scientific activity is focused on the development and the application of engineering methods and tools for product design and simulation, CAD-based applications, parametric and free-form modelling, 3D digital reconstruction in the cultural heritage, biomedical and industrial fields. Specific examples are:

- Study, development and application of CAD-CAE-CAT tools for product development: CAD-based applications for the solution of engineering problems; CAE product and process simulation (e.g. polymer injection moulding); definition of CAT approaches and simulation of 3D tolerance chains in industrial assemblies.
- Digital reconstruction of industrial components and cultural heritage artefacts by 3D laser scanning and photogrammetry. Reverse modelling, parametric 3D CAD and free form modelling. Non-contact dimensional control.
- Integration of methods, techniques and tools for engineering design and product development, particularly in the early stages of concept design and during the identification of user requirements; design for manufacturing / additive

manufacturing / assembly; Design of Experiments and multi-objective optimization; co-design applied to the development of assistive devices for the upper limb.

- Development of biomedical devices and customised assistive devices for the upper limb, co-designed with patients and produced using additive manufacturing (3D printing).

MOST RELEVANT ACADEMIC PUBLICATIONS AND CONFERENCE PAPERS FOR LINE 11 OF PNRR

1. Furferi, R., Colombini, M.P., Seymour, K., Pelagotti, A., Gherardini, F. (2024) The Future of Heritage Science and Technologies: Papers from Florence Heri-Tech 2022, *Heritage Science*, 2024, 12(1), 155. DOI: 10.1186/s40494-024-01248-8
2. Kat, C.-J., Skrickij, V., Shyrokau, B., Kojis, P., Dhaens, M., Mantovani, S., Gherardini, F., Strano, S., Terzo, M., Fujimoto, H., Sorniotti, A., Camocardi, P., Victorino, A.C., Ivanov, V. (2024) Vibration-Induced Discomfort in Vehicles: A Comparative Evaluation Approach for Enhancing Comfort and Ride Quality, *SAE International Journal of Vehicle Dynamics, Stability, and NVH*, 2024, 8(2). DOI: 10.4271/10-08-02-0009
3. Sandri, G., Spinella, A., Sartini, S., Caselgrandi, F., Schiavi, M., Bettelli, V., Gherardini, F., Amati, G., Lumetti, F., Mascia, M.T., Secchi, O., Giuggioli, D. (2024) Assessing hand grasp in patients with systemic sclerosis using the 16-grasp test: Preliminary results from a multidisciplinary study group, *Journal of Hand Therapy*, 2024. DOI: 10.1016/j.jht.2023.09.013
4. Bertoncelli, P., Gherardini, F.*, Dalpadulo, E., Lorient, A., Vergnano, A., Leali, F. (2024) Computer-based design and manufacturing for the reproduction of classic car spare parts. In: Proc. of the International Conference on Design Tools and Methods in Industrial Engineering III - ADM 2023, 6 - 8 September 2023, Firenze (Italy). Lecture Notes in Mechanical Engineering, Design Tools and Methods in Industrial Engineering III pp 546–553, 2024. DOI: 10.1007/978-3-031-52075-4_62
5. Lamontagne, M.-E., Pellichero, A., Tostain, V., Routhier, F., Flamand, V., Campeau-Lecours, A., Gherardini, F., Thébaud, M., Coignard, P., Allègre, W. (2024) The REHAB-LAB model for individualized assistive device co-creation and production. *Assistive Technology*, 2023, 36:2, 154-163, DOI: 10.1080/10400435.2023.2229880
6. Tagliacuzzi, G., Della Santa, S., Gherardini, F. (2023) Design of a living lab for autonomous driving: an investigation under the lens of the triple helix model. *Journal of Technology Transfer*, 2023 [published online](#)) DOI: 10.1007/s10961-023-10009-x
7. Cavas, F., Paredes, M., Gherardini, F., Gómez, C. (2023) Additive Manufacturing Technologies For Sustainable-Intelligent Structures: A New Concept Of Multidimensional Printing. *Dyna (Spain)*, 2023, 98(1). DOI: 10.6036/10778
8. Bici, M., Gherardini, F., de Los Angeles Guachi-Guachi, L., Guachi, R., Campana, F. (2023) Convolutional Neural Network for Background Removal in Close Range Photogrammetry: Application on Cultural Heritage Artefacts. In: Proc. of International Joint Conference on Mechanics, Design Engineering and Advanced Manufacturing - JCM 2022, 01 – 03 June 2022, Ischia (Italy). Lecture Notes in Mechanical Engineering, 2023, pp. 780–792. DOI: 10.1007/978-3-031-15928-2_68
9. Galati, N., Gherardini, F.*; Guitoli, C., Vergnano, A. (2023) Simulation-based design of reconfigurable moulds for injection overmoulding. In: Proc. of International Joint Conference on Mechanics, Design Engineering and Advanced Manufacturing - JCM 2022, 01 – 03 June 2022, Ischia (Italy). Lecture Notes in Mechanical Engineering, 2023, pp. 1159–1171. DOI: 10.1007/978-3-031-15928-2_101
10. Di Angelo, L., Furferi, R., Gherardini, F., Guardiani, E. (2022) The integration of morphological design and topology optimization to enhance the visual quality of electricity pylons. *Frontiers in Mechanical Engineering*, 2022, 8, 1061905. DOI: 10.3389/fmech.2022.1061905
11. Dalpadulo, E., Petruccioli, A., Gherardini, F.*, Leali, F. (2022) A Review of Automotive Spare-Part Reconstruction Based on Additive Manufacturing. *Journal of Manufacturing and Materials Processing*, 2022, 6(6), 133. DOI: 10.3390/jmmp6060133
12. Gherardini, F.*, Sirocchi, S. (2022) Systematic integration of 2D and 3D sources for the virtual reconstruction of lost heritage artefacts: The equestrian monument of Francesco III d'Este (1774-1796, Modena, Italy). *Heritage Science*. *Heritage Science*, 2022, 10(1), 96. DOI: 10.1186/s40494-022-00711-8
13. Petruccioli, A., Gherardini, F.*, Leali, F. (2022) Assessment of close-range photogrammetry for the low cost development of 3D models of car bodywork components, *International Journal on Interactive Design and Manufacturing (IJIDeM)*, 2022, 16(2), pp. 703–713. DOI : 10.1007/s12008-022-00865-6
14. Garlaschelli, G., Gherardini, F.*, Malagola, S., Leali, F. (2022) Investigation of Warpage and Tolerances in Injection Moulding Components Based on Simulation and Experimental Validation. In: Proc. of the International Conference

- on Design Tools and Methods in Industrial Engineering II - ADM 2021, 9-10 September 2021, Roma (Italy). Lecture Notes in Mechanical Engineering, 2022, pp. 342–353. DOI: 10.1007/978-3-030-91234-5_35
15. Tagliacucchi, G., Marchi, G., Gherardini, F.*, Leali, F. (2021) The multiple roles of universities in U-I collaborations: The case of Emilia–Romagna motor vehicle industry. *Journal of Engineering and Technology Management - JET-M*, 2021, 62, 101645. DOI: 10.1016/j.jengtecman.2021.101645
 16. Ghosh, M., Obaidullah, S.M., Gherardini, F.*, Zdimalova, M. (2021) Classification of geometric forms in mosaics using deep neural network. *Journal of Imaging*, 2021, 7(8), 149. DOI: 10.3390/jimaging7080149
 17. Petruccioli, A., Gherardini, F.*, Panari, D., Leali, F. (2021) Computer-Aided Tolerancing Analysis of a High-Performance Car Engine Assembly. In: Proc. of International Joint Conference on Mechanics, Design Engineering and Advanced Manufacturing (JCM 2020), 02 – 04 June 2020, Aix-en-Provence Cedex (France), online edition. Lecture Notes in Mechanical Engineering, 2021, pp. 121–127. DOI: 10.1007/978-3-030-70566-4_20
 18. Dalpadulo E., Gherardini, F.*, Pini F., Leali F. (2020) Integration of Topology Optimisation and Design Variants Selection for Additive Manufacturing-Based Systematic Product Redesign. *Applied Sciences (Switzerland)*, 10(21), pp. 1–13, 7841 DOI: 10.3390/app10217841
 19. Rossi, F.; Pini, F.; Carlesimo, A.; Dalpadulo, E.; Blumetti, F.; Gherardini, F.*; Leali, F. (2020) Effective integration of Cobots and additive manufacturing for reconfigurable assembly solutions of biomedical products. *International Journal on Interactive Design and Manufacturing*, 14(3), pp. 1085-1089. DOI: 10.1007/s12008-020-00682-9
 20. A. Bertoldi, F. Gherardini*, F. Leali (2020) Implementation of a quality framework on the launch phase of an automated assembly line for top class automotive chassis. IOP Conference Series: Materials Science and Engineering, 836(1), 012003, Proceedings of the 4th International Conference on Reliability Engineering (ICRE 2019), November 20-22, 2019, Rome (Italy). DOI: 10.1088/1757-899X/836/1/012003
 21. Vergnano A., Gherardini, F.*, Leali F. (2020) The Systematic Design of Industrial Products through Design Archetypes: An Application on Mechanical Transmissions. *Applied Sciences (Switzerland)*, 2020, 10(7), 2277. DOI: 10.3390/app10072277.
 22. Di Angelo, L., Gherardini, F.*, Di Stefano, P., Leali, F. (2020) Design for Visual Quality Enhancement of Artificial Infrastructure Facilities: An Application to Electricity Pylons. *Applied Sciences (Switzerland)*, 2020, 10(3), 1131. DOI: 10.3390/app10031131
 23. A. Vergnano, F. Gherardini*, A. Petruccioli, E. Bonazzi, F. Leali (2020) - Robust Parameter Analysis of Compliant Part Models for Computer Aided Tolerancing page. In: Lecture Notes in Mechanical Engineering 2020, Pages 241-254. Proceedings of the International Conference on Design Tools and Methods in Industrial Engineering - ADM 2019, Modena, September 9-10, 2019: DOI: 10.1007/978-3-030-31154-4_21
 24. Gherardini, F.*, Panari, D., Leali, F. (2019) - Identification of the main contributors in the 3D tolerances assessment in mechanical transmissions. In: Advances on Mechanics, Design Engineering and Manufacturing II, Lecture Notes in Mechanical Engineering series, pp 152-161, Springer, Cham (Switzerland). Print ISBN 978-3-030-12345-1 Online ISBN 978-3-030-12346-8. First Best Paper Award at the JCM 2018 (Cartagena, Spain). DOI: https://doi.org/10.1007/978-3-030-12346-8_15
 25. E. Adami, F. Gherardini*, M. Peroni, A. Brentegani, F. Leali (2017) - Design Archetype of Synchronizers in Mechanical Transmissions, Proceedings of ICIDM 2017, International Conference on Innovative Design and Manufacturing, July 17-18, 2017, Milan, Italy. ISBN: 9791220026369 (NO Scopus)
 26. F. Gherardini*, C. Renzi, F. Leali (2017) – A systematic user-centred framework for engineering product design in small- and medium-sized enterprises (SMEs) - *International Journal of Advanced Manufacturing Technology*, Volume 91, Issue 5–8, pp 1723–1746, Print ISSN 0268-3768; Online ISSN 1433-3015. DOI: <https://doi.org/10.1007/s00170-016-9857-9>
 27. F. Gherardini*, B. Zardin, F. Leali (2016) – A parametric CAD-based method for modelling and simulation of positive displacement machines - *Journal of Mechanical Science and Technology*, Volume 30, Issue 7, pp 3253-3263. Print ISSN 1738-494X; Online ISSN 1976-3824. DOI: <https://doi.org/10.1007/s12206-016-0634-3>
 28. M. Ansaloni, E. Bonazzi, F. Gherardini, F. Leali (2016) - Genetic algorithm optimization and robustness analysis for the computer aided design of fixture systems in automotive manufacturing, in: Research in Interactive Design Vol. 4, Proceedings of the 2014 Joint Conference on Mechanical Design Engineering and Advanced Manufacturing, held in June 2014 in Toulouse, France pp 229-235, Editors: Fischer, X., Daidie, A., Eynard, B., Paredes, M., Springer International Publishing, ISBN 978-3-319-26119-5 (NO Scopus)
 29. A.O. Andrisano, F. Gherardini*, F. Leali, M. Pellicciari, A. Vergnano (2011) - Design Of Simulation Experiments method for Injection Molding process optimization - IMProVe 2011 - International Conference on Innovative Methods in Product Design - Proceedings - Libreria Cortina Padova (ITA) - pp. da 85 ISBN: 9788877843289 (NO Scopus)

30. A.O. Andrisano, M. Ansaloni, F. Gherardini, F. Leali, M. Pellicciari, F. Pini, A. Vergnano (2011) - Una metodologia innovativa di progettazione integrata per l'analisi e la caratterizzazione della sensitività delle performance - Quinta giornata di studio Ettore Funaioli - Società Editrice Esculapio Bologna (ITA)) - pp. da 97 a 113 ISBN: 9788874885169

HONORS AND AWARDS

1. Best Paper Award at the 12th JCM - Joint Conference on Mechanics, Design Engineering & Advanced Manufacturing - 33rd INGEGRAF 2024 International Meeting, held on June 12-14, 2024, in Valencia (Spain) for the paper: "Directed Energy Deposition Build Strategy Simulation And Optimization For Additive Remanufacturing". Authors: Enrico Dalpadulo, Fabio Pini, Francesco Gherardini, Francesco Leali
2. Best Paper Award at the JCM 2018 - Joint Conference on Mechanics, Design Engineering & Advanced Manufacturing, held on June 20-22, 2018, in Cartagena (Spain) for the paper: "Identification of the main contributors in the 3D tolerances assessment in mechanical transmissions" by Francesco Gherardini, Davide Panari, Francesco Leali.
3. Best Paper Award at the JCM 2014 - Joint Conference on Mechanics, Design Engineering & Advanced Manufacturing, held on June 18-20, 2014, in Toulouse (France) for the paper: "Genetic algorithm optimization and robustness analysis for the computer aided design of fixture systems in automotive manufacturing" by Matteo Ansaloni, Enrico Bonazzi, Francesco Gherardini, Francesco Leali.

MEMBER OF THE EDITORIAL BOARD OF SCIENTIFIC JOURNALS AND SEIRES

- Heritage Science, ISSN: 2195-4356, Publisher: Springer Nature Switzerland AG. Since 29/03/2021 - present
Collana che pubblica gli atti delle conferenze internazionali JCM e ADM (conferenze ING-IND/15)
Indexed in Scopus, Category: Arts and Humanities: Conservation; Arts and Humanities: Archeology (arts and humanities); Social Sciences: Archeology
 - <https://heritagesciencejournal.springeropen.com/>
 - <https://www.scopus.com/sourceid/21100286950>
 - <https://www.scimagojr.com/journalsearch.php?q=21100286950&tip=sid&clean=0>
- Lecture Notes in Mechanical Engineering (series), ISSN: 2195-4356, Publisher: Springer Nature Switzerland AG. Since 07/11/2019 - present.
Indexed in Scopus, Category: Engineering, Aerospace Engineering; Automotive Engineering; Mechanical Engineering; Chemical Engineering: Fluid Flow and Transfer Processes
 - <https://www.springer.com/series/11236?detailsPage=editorialBoard>
 - <https://www.scopus.com/sourceid/21100431311>
 - <https://www.scimagojr.com/journalsearch.php?q=21100431311&tip=sid&clean=0>
- International Journal of Design Sciences and Technology, ISSN 1630-7267, Publisher: Europaia Productions. Since 10/05/2019 – present.
Indexed in Scopus, Category: Engineering, General Engineering (miscellaneous)
 - <http://ijdst.europia.org/index.php/ijdst/about/editorialTeam>
 - <https://www.scopus.com/sourceid/500147012>
 - <https://www.scimagojr.com/journalsearch.php?q=500147012&tip=sid&clean=0>

TUTORING ACTIVITY

Tutor of a PhD Student of the Doctoral School of Engineering "Enzo Ferrari", University of Modena and Reggio Emilia.

Co-tutor of a PhD Student of the Doctoral School in Automotive for Smart Mobility, University of Bologna.

Tutor and Co-tutor of 9 Master's Degree Students in Vehicle Engineering and Mechanical Engineering, University of Modena and Reggio Emilia.

Tutor and Co-Tutor of 65 Bachelor's Degree Students in Vehicle Engineering and Mechanical Engineering, University of Modena and Reggio Emilia.

PERSONAL SKILLS

Languages:

- **Italian:** Mother tongue

- **English:** professional proficiency (writing, reading); intermediate (speaking)

COMPETENCES

CAD	3DExperience – Dassault Systemes Catia V6/V5 - Dassault Systemes SolidWorks – Dassault Systemes AutoCAD 2D – Autodesk Inventor – Autodesk Solid Edge - Siemens Rhinoceros
CAE (Computer-Aided Engineering)	Moldex3D (injection molding simulation) - CoreTech System Co., Ltd. SolidWorks Simulation (linear structural analysis)
CAT (Computer-Aided Tolerancing)	3DCS - Dimensional Control Systems, Inc. Cetol6σ – Sigmetrix, Enginsoft
Reverse Engineering and quality control	Scanner Laser 3D: Konica Minolta Range 7 Geomagic Studio and Geomagic Control (ex Qualify) Photogrammetry: Agisoft Metashape (Photoscan) Photogrammetry: Autodesk Recap
Software	Design Expert – Design Of Experiments software ModeFrontier – Optimization software Patent search software Material selection software
NPD Techniques	DOE, QFD, FMEA
Office	Word, Excel, Powerpoint

The undersigned is aware that false declarations, falsity of documents and the use of false documents are punished under the penal code and special laws, according to art. 26 of law 15/68.

The undersigned authorizes the processing of personal data according to art. 13 of Legislative Decree 196/2003.

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV.

Modena, 30/06/2024

Francesco Gherardini