

University Academic Curriculum Vitae

Lorenzo Maccioni

Personal information

Name: Lorenzo Maccioni
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Education

- 2014, Bachelor in Mechanical Engineering, Università degli studi di Firenze, Scuola di Ingegneria, Florence (Italy). Title of the Thesis: "Progettazione della parte prodiera di un veicolo sottomarino autonomo - Design of the bow of an autonomus underwater veichle". Mark 99/110
- 2016, Master of Science in Mechanical Engineering, Università degli studi di Firenze, Scuola di Ingegneria, Florence (Italy). Title of the Thesis: "Progettazione di un Sistema di riduzione cicloidale per mescolatori da cantiere – Design of a cycloidal gear reduction system for construction site mixer". Mark 110/110 cum laude
- 2016-2020, PhD student in Sustainable Energy and Technologies, Free University of Bozen|Bolzano, Bolzano (Italy). Title of the Thesis: "Enhancing Product Value by Sustainability-Oriented Choices in the Early Design Processes". Judgment Excellent.
- 2023, qualification for the functions of Associate Professor in the Competitive Sector 09/A3 "Industrial design, machine construction and metallurgy" according to Italian legislation "Abilitazione Scientifica Nazionale" (ASN II fascia).

Internships and Periods Abroad

- 2016, (8 months) Internship at the Laboratory of Methods & Techniques for Innovation, Università degli studi di Firenze, Scuola di Ingegneria, Department of Industrial Engineering, Florence (Italy)
- 2019, (5 months) Visiting PhD student at the Technical University of Denmark (DTU), Department of Mechanical Engineering, Lyngby (Denmark)
- 2020-2022, (5 weeks) Visiting Researcher at the Chalmers University of Technology, Mechanics and Maritime Sciences, Göteborg, Sweeden
- 2023 (2 weeks) Visiting Researcher at the Brno University of Technology, Faculty of Mechanical Engineering, Institute of Machine and Industrial Design, Brno, Czech Republic
- 2023-2024 High school teacher at the Istituto Salesiano Maria Ausiliatrice – Rainerum Salesiani Don Bosco, Technical Institute, Bolzano (Italy).

Present appointment

- Title of appointment: PostDoc
- Start of appointment: 15/01/2024
- Level of appointment: international context
- The project "Agritech - Spoke 4 National Research Centre for agricultural technologies. CN0000022" (PI Prof. Renato Vidoni).
- Brief description of responsibilities: The research activity encompasses the development and implementation of digital models for agro-forestry machinery, the definition, development, realization, and installation of mechatronic/sensory devices and their communication protocols to be installed on agro-forestry machinery/equipment (such as chainsaws or multifunctional robots), and the development, implementation, and validation of "sensor fusion" algorithms and data processing for operational monitoring.

Research Interests

- Computational Fluid Dynamics of lubricated mechanical parts through open access software e.g. OpenFOAM®.
- Mesh handling techniques to manage the topological changes of the computational domain and/or to reduce the computational effort for numerical simulation of lubricated mechanical systems.
- Development of algorithms for implementing HCF criteria based on the critical plane approach on FEM results of machine components.
- Material characterization through experimental and numerical tests
- Design methods and techniques
- Innovation, conceptual design and inventive problem solving (TRIZ)
- Additive manufacturing
- Biometric measures and devices in experimental design research
- New value proposition, Human/User-Centered Design
- Eco-design, eco-innovation and design for sustainability

Professional experience

From / to	Job title	Name of academic Institution	Academic level	Responsibilities
October 2020/ September 2023	Cfd simUlations of Bearing (CUBE)	UNIBZ	Assistant Professor (RTD Junior)	Development and fine-tuning of numerical methods to study roller bearings lubrication. Design and development of experimental campaign to validate the numerical results.
August 2019/ July 2020	Industrial applicability of Eye-Tracking for production and design in SMEs (EYE-TRACK)	UNIBZ	Research Assistant	Acquisition and numerical processing of biometric data in order to support the (re)design of industrial products by studying the applicability of biometric devices in SMEs. Planning and carrying out experiments.
July 2019/ July 2020	fine-tuning new and smart ECO-design guidelines (few sECOnds)	UNIBZ	Member of the Research Team	Developing and testing eco-design methods to favor the acceptance of eco-designed solutions.

During the period that can be referred to the appointment at UNIBZ (November 2016 – July 2020), Dr. Maccioni has provided his research contribution in some funded projects, see below.

From / to	Name of the Project	Scientific Responsibility	Activities carried out during the collaboration
March 2018/ July 2020	Additive Manufacturing FDM: Dimensional Accuracy and Product Acceptability (AMDAPA)	Dr. Pasquale Russo Spena (until 31/12/2018); Dr. Guido Orzes (since 01/01/2019)	Design and manufacturing of products using additive technologies. Planning and carrying out experiments to measure the perception of products printed through FDM 3D printer.
November 2019/ April 2020	Additive manufacturing for advanced functional Design (M,AM.De)	Dr. Franco Concli	Data Analysis of low and high cycle fatigue tests carried out on 17-4 PH Stainless Steel Manufactured via Selective Laser Melting
November 2019/ July 2020	Cfd simUlations of Bearing (CUBE)	Dr. Franco Concli	Carrying out a systematic and critical analysis of the state of the art regarding the CFD techniques for studying the lubricant behavior in mechanical components. Meshing a tapered roller bearing through BlockMesh in OpenFOAM®. Design of a vertical test rig for performing PIV tests on a tapered roller bearing.

Experience in academic teaching

Role of the Candidate	Course Name	Language and hours	University and Faculty	Program	Appointee	Academic Year
Contract Lecturer	Mechatronics and Process Automation	English, 12 hours	UNIBZ, Faculty of Engineering	Bachelor in Wood Engineering	Prof. Renato Vidoni	2023/2024
Teaching Assistant	Reverse Engineering and Rapid Prototyping	English, 12 hours	UNIBZ, Faculty of Engineering	M.Sc. in Industrial and Mechanical Engineering	Prof. Yuri Borgianni	2023/2024
Teaching Assistant	Reverse Engineering and Rapid Prototyping	English, 12 hours	UNIBZ, Faculty of Engineering	M.Sc. in Industrial and Mechanical Engineering	Prof. Yuri Borgianni	2022/2023
Teaching Assistant	Reverse Engineering and Rapid Prototyping	English, 12 hours	UNIBZ, Faculty of Science and Technology	M.Sc. in Industrial and Mechanical Engineering	Dr. Yuri Borgianni	2021/2022
Teaching Assistant	Reverse Engineering and Rapid Prototyping	English, 12 hours	UNIBZ, Faculty of Science and Technology	M.Sc. in Industrial and Mechanical Engineering	Dr. Yuri Borgianni	2020/2021
Teaching Assistant	Reverse Engineering and Rapid Prototyping	English, 12 hours	UNIBZ, Faculty of Science and Technology	M.Sc. in Industrial and Mechanical Engineering	Dr. Yuri Borgianni	2019/2020
Contract Lecturer	Technical Drawing and CAD / CAD Fundamentals	English, 18 hours	UNIBZ, Faculty of Science and Technology	B.Sc. in Industrial and Mechanical Engineering	Dr. Yuri Borgianni	2019/2020

Dr. Maccioni has been member of the following exam commissions at UNIBZ:

- Reverse Engineering and Rapid Prototyping.
- Technical Drawing and Industrial Engineering Methods.
- CAD Fundamentals.
- Technical Drawing – CAD.
- Design and Manufacturing of Industrial Products.
- Advanced topics on machine design
- Materials behaviour and machine elements.
- Mechatronics and Process Automation.
- Thermo-Mechanicals Measurements

Other academic responsibilities

Dr. Maccioni is/has been responsible of the following laboratories:

- Prototyping and Additive Manufacturing Lab (C002b) at UNIBZ

Dr. Maccioni has been the secretary of the Industrial Engineering and Automation macro-area at UNIBZ from September 2022 to September 2023.

Dr. Maccioni has acted as chair for the following conference:

- 21st ETRIA World Conference “TRIZ Future” 2021 (TFC21), Bolzano,

Italy, 22nd – 24st September 2021 – special session “Inventive applications targeting sustainability” in cooperation with Dr. Hans-Gert Graebe.

- 2nd International Symposium on Industrial Engineering and Automation ISIEA 2023, Bolzano, Italy 22nd – 23rd June 2023 – special session “Numerical Approaches and Digitalization in Mechanical Engineering”.

Dr. Maccioni is/has been member of the editorial board of the following scientific Journals:

- Topic Editor member of the international Journal "Sustainability"(MDPI).
- Review Editor member of the international Journal “Frontiers in Mechanical Engineering” (Frontiers Media S.A.).
- Review Editor member of the international Journal “Frontiers in Industrial Engineering” (Frontiers Media S.A.).

Dr. Maccioni is/has been reviewer for the following scientific Journals:

- Elsevier – Journal of Cleaner Production
- Elsevier – Tribology International
- Elsevier – Sustainable Production & Consumption
- Elsevier – International Journal of Heat and Mass Transfer
- MDPI – Lubricants
- MDPI – Sustainability
- MDPI – Applied Science
- MDPI – Machines
- MDPI – Mathematics
- MDPI – Process
- MDPI – Agriculture
- MDPI –International Journal of Environmental Research & Public Health
- Cambridge – Design Science
- Cambridge – Artificial Intelligence for Engineering Design, Analysis and Manufacturing: AIEDAM
- Emerald – Journal of Engineering Design and Technology
- Zhejiang University – Journal of Zhejiang University: Science A
- Frontiers Media S.A. – Frontiers in Psychology
- Frontiers Media S.A. – Frontiers in Mechanical Engineering
- Frontiers Media S.A. – Frontiers in Industrial Engineering
- Taylor & Francis – Mechanics Based Design of Structures and Machines, An International Journal

Other academic responsibilities

Dr. Maccioni is/has been member of the scientific committee, reviewers’ board or program committee of the following international conferences and events:

- International Conference on Sustainable Design and Manufacturing (SDM):
 - 7th edition, Split, Croatia, 24-26 June 2020
- ETRIA world conference TRIZ future (TFC):
 - 21st edition, Bozen-Bolzano, Italy, 22-24 September 2021

- 22nd edition, Warsaw, Poland, 27-29 September 2022
 - 23rd edition, Offenburg, Germany, 12-14 September 2023
- Industrial Engineering and Automation (ISIEA):
 - 2nd edition, Bolzano, Italy, 22-23 September 2023

Dr. Maccioni is/has been Guest Editor for the following Special Issues:

- “Years of Design Creativity research: What is Industry Aware of?” in the Journal of Engineering, Design and Technology - Emerald; other guest editors are Prof. Federico Rotini, Dr. Yuri Borgianni, and Dr. Lorenzo Fiorineschi.
- “Vibration-Based Health Monitoring of Mechanical Systems 2021” in the journal Shock and Vibration - Hindawi; other guest editors are Dr. Franco Concli, and Prof. Claudio Sbarufatti.
- Guest Editor for the research topic "Numerical Methods for Additive Manufacturing Materials" for the international journal "Frontiers in Mechanical Engineering" in collaboration with Professor Franco Concli.

Dr. Maccioni has so far supervised or co-supervised the following Master/Bachelor students:

- Anil Balikci, Master Student at UNIBZ, Title of the Thesis “A Framework to Design for Sustainable Product Use and to Support the Transition to Product-Service Systems” in cooperation with Dr. Yuri Borgianni
- Lorenzo Pagliari, Master Student at UNIBZ, Title of the Thesis “Retrofit of a Fiat Grande Punto with a hybrid transmission system for efficiency improvement” in cooperation with Dr. Franco Concli
- Federico Zadra, Bachelor Student at UNIBZ, Title of the Thesis “Design of an innovative retractable mechanism for a spiral staircase” in cooperation with Dr. Franco Concli
- Tobias Rabensteiner, Bachelor Student at UNIBZ, Title of the Thesis “CFD simulations of a grease-lubricated needle roller bearing to estimate the mechanical performances and grease distribution at different operating conditions” in cooperation with Dr. Franco Concli
- Andreas Voelser, Bachelor Student at UNIBZ, Title of the Thesis “Analysis of double-row tapered roller bearing lubricants in OpenFOAM®” in cooperation with Dr. Franco Concli
- Alexander K. Seelmann, Bachelor Student at UNIBZ, Title of the Thesis “CFD study of bearing lubrication for high speed applications: effect of compressibility on power losses” in cooperation with Dr. Franco Concli.
- Michele Spazzini, Bachelor Student at UNIBZ, Title of the Thesis “Reinventing maglev speedcubes” in cooperation with Dr. Franco Concli.
- Arturo Berrio Fernandez, master student at UNIBZ, Title of the Thesis “Development of a virtual model to predict the NVH-Performance of a sunroof” in cooperation with Dr. Franco Concli.

Other academic responsibilities

Dr. Maccioni has so far supervised or co-supervised the following PhD students:

- Lorenzo Pagliari, PhD Student at UNIBZ, main research topic “Low-Cycle Fatigue” in cooperation with Prof. Franco Concli.
- Lorenzo Fraccaroli, PhD Student at UNIBZ, main research topic “High-Cycle Fatigue” in cooperation with Prof. Franco Concli.
- Ragul Gandhi, PhD Student at UNIBZ, main research topic “Fatigue in additive manufactured components” in cooperation with Prof. Franco Concli.

- Seyed Ahmad Taghizadeh, PhD Student at UNIBZ, main research topic “Bio-inspired composite materials” in cooperation with Prof. Franco Concli.
- Gbagba Sadiq Omobowale, PhD Student at UNIBZ, main research topic “machine learning in welding monitoring” in cooperation with Prof. Franco Concli.

Membership

Dr. Maccioni is/has been member of the following scientific bodies:

- Società Scientifica Italiana di Progettazione Meccanica e Costruzione di Macchine (AIAS);
- Associazione Disegno e Metodi dell'Ingegneria Industriale (ADM);
- Design Society;
- European TRIZ Association (ETRIA);
- KES International;

Publications

International Journals

1. **Maccioni, L.**, Borgianni, Y. & Basso, D. (2019). Value perception of green products: an exploratory study combining conscious answers and unconscious behavioral aspects. *Sustainability*, 11(5), 1226. <https://doi.org/10.3390/su11051226>
2. Borgianni, Y., **Maccioni, L.**, & Basso, D. (2019). Exploratory study on the perception of additively manufactured end-use products with specific questionnaires and eye-tracking. *International Journal on Interactive Design and Manufacturing (IJIDeM)*, 13(2), 743-759. <https://doi.org/10.1007/s12008-019-00563-w>
3. Del Fatto, V., Dignös, A., Raimato, G., **Maccioni, L.**, Borgianni, Y., & Gamper, J. (2019). Visual time period analysis: a multimedia analytics application for summarizing and analyzing eye-tracking experiments. *Multimedia Tools and Applications*, 1-26. <https://doi.org/10.1007/s11042-019-07950-1>
4. **Maccioni, L.**, Borgianni, Y., & Pigosso, D. (2019). Can the choice of eco-design principles affect products' success? *Design Science*, 5, E25. <https://doi.org/10.1017/dsj.2019.24>
5. Borgianni, Y., & **Maccioni, L.** (2020). Review of the use of neurophysiological and biometric measures in experimental design research. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing (AI EDAM)*, 34(2), 248-285. <https://doi.org/10.1017/S0890060420000062>

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6. Berni, A., **Maccioni, L.**, & Borgianni, Y. (2020). Observing Pictures and Videos of Creative Products: An Eye Tracking Study. *Applied Science*, 10, 1480. <https://doi.org/10.3390/app10041480>
7. Borgianni, Y., **Maccioni, L.**, Fiorineschi, L., & Rotini, F. (2020). Forms of stimuli and their effects on idea generation in terms of creativity metrics and non-obviousness. *International Journal of Design Creativity and Innovation*, 1-18. <https://doi.org/10.1080/21650349.2020.1766379>

8. **Maccioni, L.**, Bietresato, M., & Borgianni, Y. (2020). From the Extraction of Currently Fulfilled Requirements to Value Curves: A Case Study in the Field of Harvesting Machines for Shell Fruits and Lessons Learnt in Engineering Design. *Applied Science*, 10, 3809. <https://doi.org/10.3390/app10113809>
9. Concli, F., **Maccioni, L.**, & Gorla, C. (2020). Development of a computational fluid dynamics simulation tool for lubrication studies on cycloidal gear sets. *International Journal of Computational Methods and Experimental Measurements*, 8(3), 220-232. <https://doi.org/10.2495/CMEM-V8-N3-220-232>
10. Concli, F., & **Maccioni, L.** (2020). Fracture locus of a Cor-Ten weathering steel: Experimental–numerical calibration. *International Journal of Computational Methods and Experimental Measurements*, 8(3), 243-251. <https://doi.org/10.2495/CMEM-V8-N3-243-251>
11. **Maccioni, L.**, & Concli, F. (2020). Computational Fluid Dynamics Applied to Lubricated Mechanical Components: Review of the Approaches to Simulate Gears, Bearings, and Pumps. *Applied Sciences*, 10(24), 8810. <https://doi.org/10.3390/app10248810>
12. Pieroni, M. P., McAlloone, T. C., Borgianni, Y., **Maccioni, L.**, & Pigozzo, D. C. (2021). An expert system for circular economy business modelling: advising manufacturing companies in decoupling value creation from resource consumption. *Sustainable Production and Consumption*. <https://doi.org/10.1016/j.spc.2021.01.023>
13. **Maccioni, L.**, Borgianni, Y., & Pigozzo, D. C. (2021). Creativity in successful eco-design supported by ten original guidelines. *International Journal of Design Creativity and Innovation*, 1-24. <https://doi.org/10.1080/21650349.2021.1965033>
14. Concli, F., Fraccaroli, L., & **Maccioni, L.** (2021). Gear Root Bending Strength: A New Multiaxial Approach to Translate the Results of Single Tooth Bending Fatigue Tests to Meshing Gears. *Metals*, 11(6), 863. <https://doi.org/10.3390/met11060863>
15. Concli, F., **Maccioni, L.**, Fraccaroli, L., & Bonaiti, L. (2021). Early Crack Propagation in Single Tooth Bending Fatigue: Combination of Finite Element Analysis and Critical-Planes Fatigue Criteria. *Metals*, 11(11), 1871. <https://doi.org/10.3390/met11111871>
16. Balicki, A., Borgianni, Y., **Maccioni, L.**, & Nezzi, C. (2021). A Framework of Unsustainable Behaviors to Support Product Eco-Design. *Sustainability*, 13(20), 11394. <https://doi.org/10.3390/su132011394>
17. **Maccioni, L.**, Chernoray, V. G., Bohnert, C., & Concli, F. (2022). Particle Image Velocimetry measurements inside a tapered roller bearing with an outer ring made of sapphire: Design and operation of an innovative test rig. *Tribology International*, 165, 107313. <https://doi.org/10.1016/j.triboint.2021.107313>

18. **Maccioni, L.**, Chernoray, V. G., Mastrone, M. N., Bohnert, C., & Concli, F. (2022). Study of the impact of aeration on the lubricant behavior in a tapered roller bearing: innovative numerical modelling and validation via particle image velocimetry. *Tribology International*, 107301. <https://doi.org/10.1016/j.triboint.2021.107301>
19. Concli, F., **Maccioni, L.**, Fraccaroli, L., & Cappellini, C. (2022). Effect of Gear Design Parameters on Stress Histories Induced by Different Tooth Bending Fatigue Tests: A Numerical-Statistical Investigation. *Applied Sciences*, 12(8), 3950. <https://doi.org/10.3390/app12083950>
20. Concli, F., **Maccioni, L.**, & Fraccaroli, L. (2022). Exploiting a numerical method to translate single tooth bending fatigue results into meshing gears design data: the influence of material properties. *International Journal of Computational Methods and Experimental Measurements*, 10(3), 211-223. <https://doi.org/10.2495/CMEM-V10-N3-211-223>
21. Gandhi, R., **Maccioni, L.**, & Concli, F. (2022). Significant Advancements in Numerical Simulation of Fatigue Behavior in Metal Additive Manufacturing-Review. *Applied Sciences*, 12(21), 11132. <https://doi.org/10.3390/app122111132>
22. Borgianni, Y., **Maccioni, L.**, Dignös, A., Basso, D. (2022). A Framework to Evaluate Areas of Interest for Sustainable Products and Designs. *Sustainability*. 14(13):7931. <https://doi.org/10.3390/su14137931>
23. Cappellini, C., Borgianni, Y., **Maccioni, L.**, & Nezzi, C. (2022). The effect of process parameters on geometric deviations in 3D printing with fused deposition modelling. *The International Journal of Advanced Manufacturing Technology*, 122, 1763–1803. <https://doi.org/10.1007/s00170-022-09924-4>
24. Alomar, Z., **Maccioni, L.**, & Concli, F. (2023). Development and Implementation of Element Deletion Algorithm into an Open-Source Software Based on the Fracture Locus of Materials. *Materials*, 16(1), 187. <https://doi.org/10.3390/ma16010187>
25. **Maccioni, L.**, Concli, F., & Blagojevic, M. (2023). A new three-stage gearbox concept for high reduction ratios: Use of a nested-cycloidal architecture to increase the power density. *Mechanism and Machine Theory*, 181, 105203. <https://doi.org/10.1016/j.mechmachtheory.2022.105203>
26. **Maccioni, L.**, Chernoray, V. G., & Concli, F. (2023). Fluxes in a full-flooded lubricated Tapered Roller Bearing: Particle Image Velocimetry measurements and Computational Fluid Dynamics simulations. *Tribology International*, 188, 108824. <https://doi.org/10.1016/j.triboint.2023.108824>
27. **Maccioni, L.**, R uth, L., Koch, O., & Concli, F. (2023). Load-independent power losses of full-flooded lubricated tapered roller bearings: Numerical and experimental investigation of the effect of operating temperature and housing walls distances. *Tribology Transactions*, 66(6), 1078-1094.

<https://doi.org/10.1080/10402004.2023.2254957>

28. Wingertszahn, P., Koch, O., **Maccioni, L.**, Concli, F., & Sauer, B. (2023). Predicting Friction of Tapered Roller Bearings with Detailed Multi-Body Simulation Models. *Lubricants*, 11(9), 369. <https://doi.org/10.3390/lubricants11090369>
29. Gbagba, S., **Maccioni, L.**, & Concli, F. (2024). Advances in Machine Learning Techniques Used in Fatigue Life Prediction of Welded Structures. *Applied Sciences*, 14(1), 398. <https://doi.org/10.3390/app14010398>

Publications

International Conferences - Papers

1. **Maccioni, L.**, Borgianni, Y., & Rotini, F. (2017). Sustainability as a value-adding concept in the early design phases? Insights from stimulated ideation sessions. In *International Conference on Sustainable Design and Manufacturing* (pp. 888-897). Springer, Cham. Bologna, Italy. https://doi.org/10.1007/978-3-319-57078-5_83
2. Wallisch, A., **Maccioni, L.**, Trautmann, L., Ostermeyer, E., Borgianni, Y., & Borg, J. C. (2018). Lessons learnt in designing transportation solutions for elderly people following a participatory approach. In *International Design Conference*. Design Society. Dubrovnik, Croatia. <https://doi.org/10.21278/idc.2018.0361>
3. **Maccioni, L.**, & Borgianni, Y. (2018). A product success scale for supporting research in engineering design. In *International Design Conference*. Design Society. Dubrovnik, Croatia. <https://doi.org/10.21278/idc.2018.0494>
4. Borgianni, Y., Rauch, E., **Maccioni, L.**, & Mark, B. G. (2018). User Experience Analysis in Industry 4.0-The Use of Biometric Devices in Engineering Design and Manufacturing. In *2018 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)* (pp. 192-196). IEEE. Bangkok, Thailand. <https://doi.org/10.1109/ieem.2018.8607367>
5. Borgianni, Y., **Maccioni, L.**, & Rauch, E. (2019). Using Virtual Reality to match the appearance of technical installations with landscapes. In *Human Behaviour in Design*. Tutzing, Germany.
6. Borgianni, Y., **Maccioni, L.**, & Pigosso, D. (2019). Environmental Lifecycle Hotspots and the Implementation of Eco-design Principles: Does Consistency Pay off?. In *International Conference on Sustainable Design and Manufacturing* (pp. 165-176). Springer, Singapore. Budapest, Hungary. https://doi.org/10.1007/978-981-13-9271-9_16
7. **Maccioni, L.**, & Borgianni, Y. (2019). Eco-Design and Sustainable Development: A Speculation About the Need for New Tools and Knowledge. In *International Conference on Sustainable Design and Manufacturing* (pp. 155-164). Springer, Singapore. Budapest, Hungary. https://doi.org/10.1007/978-981-13-9271-9_15
8. Concli, F., & **Maccioni, L.** (2019). Experimental–numerical calibration of

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the fracture locus of weathering steel. In Materials and Contact Characterisation IX. Wit transactions on engineering sciences, 124, 219-227. Lisbon, Portugal. <https://doi.org/10.2495/mc19021>

9. **Maccioni, L.**, & Concli, F. (2019). Fracture locus of a CORTEN steel: Finite Element calibration based on experimental results. *Procedia Structural Integrity*, 24, 738-745. <https://doi.org/10.1016/j.prostr.2020.02.065>
10. Concli, F., **Maccioni, L.**, & Gorla, C. (2019). Lubrication of gearboxes: CFD analysis of cycloidal gear set. In *Computational & Experimental Methods in Multiphase and Complex Flow X. WIT Transactions on Engineering Sciences*, 124, 101-112. WIT Press. Lisbon, Portugal. <https://doi.org/10.2495/MPF190101>
11. Concli, F., **Maccioni, L.**, & Gorla, C. (2019). Power loss analysis of different high-power density gearbox typologies: CFD analysis and experimental measurements on a cycloidal gear set. *Proceedings of the 8th International Conference on Gears VDI*, Munich, Germany. <https://doi.org/10.51202/9783181023556-101>
12. Borgianni, Y., **Maccioni, L.**, Russo Spina, P., & Shunmugavel, M. K. (2019). University education in Additive Manufacturing and the need to boost design aspects. In *Proceedings of the Design Society: International Conference on Engineering Design* (Vol. 1, No. 1, pp. 629-638). Cambridge University Press. Delft, Nederland. <https://doi.org/10.1017/dsi.2019.6>
13. Borgianni, Y., **Maccioni, L.**, Orzes, G., & Basso, D. (2019). How Do Design Changes and the Perception of Product Creativity Affect Value?. In *International Conference on Design, Simulation, Manufacturing: The Innovation Exchange* (pp. 601-611). Springer, Cham. Modena, Italy. https://doi.org/10.1007/978-3-030-31154-4_51
14. **Maccioni, L.**, & Borgianni, Y. (2019). Investigating the Value Perception of Specific TRIZ Solutions Aimed to Reduce Product's Environmental Impact. In *International TRIZ Future Conference* (pp. 282-294). Springer, Cham. Marrakech, Morocco. https://doi.org/10.1007/978-3-030-32497-1_23
15. **Maccioni, L.**, Borgianni, Y., Pigosso, D.C., & McAloone, T. (2020). Are eco-design strategies implemented in products? A study on the agreement level of independent observers. *Proceedings of the Design Society: DESIGN Conference*, 1, 2039-2048. <https://doi.org/10.1017/dsd.2020.272>
16. Berni, A., **Maccioni, L.**, & Borgianni, Y. (2020). An eye-tracking supported investigation into the role of forms of representation on design evaluations and affordances of original product features. *Proceedings of the Design Society: DESIGN Conference*, 1, 1607-1616. <https://doi.org/10.1017/dsd.2020.296>
17. **Maccioni, L.**, Rampazzo, E., Nalli, F., Borgianni, Y., & Concli, F. (2021). Low-Cycle-Fatigue Properties of a 17-4 PH Stainless Steel Manufactured via Selective Laser Melting. In *Key Engineering Materials* (Vol. 877, pp.

55-60). Trans Tech Publications Ltd.
<https://doi.org/10.4028/www.scientific.net/KEM.877.55>

18. **Maccioni, L.**, Fraccaroli, L., Borgianni, Y., & Concli, F. (2021). High-Cycle-Fatigue Characterization of an Additive Manufacturing 17-4 PH Stainless Steel. In Key Engineering Materials (Vol. 877, pp. 49-54). Trans Tech Publications Ltd.
<https://doi.org/10.4028/www.scientific.net/KEM.877.49>
19. **Maccioni, L.**, & Borgianni, Y. (2020). Bringing Success and Value in Sustainable Product Development: The Eco-design Guidelines. In Sustainable Design and Manufacturing 2020 (pp. 1-11). Springer, Singapore. https://doi.org/10.1007/978-981-15-8131-1_1
20. **Maccioni, L.**, & Borgianni, Y. (2020). Success-oriented eco-ideation sessions: lessons learnt from the use of ten eco-design guidelines. In Proceedings of the Sixth International Conference on Design Creativity (ICDC 2020) (pp. 125-132). <https://doi.org/10.35199/ICDC.2020.16>
21. **Maccioni, L.**, Borgianni, Y., & Concli, F. (2020). High Power Density Speed Reducers: A TRIZ Based Classification of Mechanical Solutions. In International TRIZ Future Conference (pp. 243-253). Springer, Cham. https://doi.org/10.1007/978-3-030-61295-5_20
22. **Maccioni, L.**, Mastrone, M. N., & Concli, F. (2021). Computational studies on cycloidal gearboxes: a systematic literature review. In IOP Conference Series: Materials Science and Engineering (Vol. 1038, No. 1, p. 012006). IOP Publishing. <https://doi.org/10.1088/1757-899X/1038/1/012006>
23. Concli, F., & **Maccioni, L.** (2021). Critical Planes Criteria Applied To Gear Teeth: Which One Is The Most Appropriate To Characterize Crack Propagation?. Wit Transactions On Engineering Sciences, 133, 15-25. <https://doi.org/10.2495/MC210021>
24. Concli, F., **Maccioni, L.**, & Bonaiti, L. (2021). Reliable Gear Design: Translation Of The Results Of Single Tooth Bending Fatigue Tests Through The Combination Of Numerical Simulations And Fatigue Criteria. Wit Transactions On Engineering Sciences, 130, 111-122. <https://doi.org/10.2495/CMEM210101>
25. **Maccioni, L.**, & Borgianni, Y. (2021). An Ideality-Based Map to Describe Sustainable Design Initiatives. In International TRIZ Future Conference (pp. 3-13). Springer, Cham. https://doi.org/10.1007/978-3-030-86614-3_1
26. Berni, A., Dallago, F., **Maccioni, L.**, Concli, F., & Borgianni, Y. (2021). The Role of Rapid Prototyping Devices in the Design and Manufacturing Practices of FabLab Visitors: A Survey. In International Conference on Design, Simulation, Manufacturing: The Innovation Exchange (pp. 401-409). Springer, Cham. https://doi.org/10.1007/978-3-030-91234-5_41
27. **Maccioni, L.**, & Concli, F. (2023). Flows in Oil-Bath Lubricated Tapered Roller Bearings: CFD Simulations Validated via PIV. Gleit- und Wälzlagerungen 2023 VDI, Schweinfurt, Germany. (pp. 247–266).

<https://doi.org/10.51202/9783181024157-247>

28. Gandhi, R., Concli, F., & **Maccioni, L.** (2023). A Finite Element Level-Set Approach for Optimizing the Topology of Complete Disc Replacement in the Lumbar Spine. In International Symposium on Industrial Engineering and Automation (pp. 609-620). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-38274-1_51
29. **Maccioni, L.**, & Concli, F. (2023). Estimation of Hydraulic Power Losses in a Double-Row Tapered Roller Bearing via Computational Fluid Dynamics. In International Symposium on Industrial Engineering and Automation (pp. 655-666). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-38274-1_55

Publications

International Conferences - Poster Presentation

1. Borgianni, Y., **Maccioni, L.**, & Rauch, E. (2018). How does product design benefit from eye tracking and biometric systems? An overview on use objectives. Poster in Design Computing Cognition (DCC18), Milan, Italy.
2. **Maccioni, L.** & Concli, F. (2022). A Novel Concept of Nested Cycloidal Speed Reducer. Poster in VDI International Conference on Gears 2022, Garching, Germany.

Publications

National Journals

1. Concli, F., & **Maccioni, L.** (2020). Calibrazione del modello di danneggiamento duttile di un acciaio CORTEN – procedura numerico-sperimentale. Quaderni di progettazione (pp 48-51).
2. Concli, F., & **Maccioni, L.** (2021). Un approccio innovativo per la progettazione affidabile di ingranaggi. Organi di trasmissione (pp 26-32).
3. Concli, F., & **Maccioni, L.** (2022). Misure PIV (Particle Image Velocimetry) in un cuscinetto a rulli conici. Organi di trasmissione (pp 34-40).
4. Concli, F., & **Maccioni, L.** (2022). Impatto dell'areazione sulla lubrificazione di un cuscinetto a rulli conici. Organi di trasmissione (pp 30-35).
5. Concli, F., & **Maccioni, L.** (2023). Nested: un nuovo concetto di riduttore a tre stadi. Organi di trasmissione (pp 28-36).

Publications

National Conferences - Papers

1. **Maccioni, L.**, & Borgianni, Y. (2017). La sostenibilità come elemento fondamentale di valore nelle fasi preliminari della progettazione. National Workshop of Associazione Nazionale Disegno e Metodi dell'Ingegneria Industriale, Milan, Italy.
2. Borgianni, Y., & **Maccioni, L.** (2018). Le attività del gruppo ING-IND/15 alla Libera Università di Bolzano. Campi di ricerca oggi e nel futuro prevedibile. National Workshop of Associazione Nazionale Disegno e Metodi dell'Ingegneria Industriale, Torino, Italy

3. **Maccioni, L., & Borgianni, Y. (2018).** Il successo della progettazione sostenibile: una questione di principio? Indagine empirica della relazione tra i principi di sostenibilità ed il valore percepito. National Workshop of Associazione Nazionale Disegno e Metodi dell'Ingegneria Industriale, Torino, Italy
4. Scuttari, A., Borgianni, Y., Kofler, I., & **Maccioni, L. (2019).** Mobile Eye Tracking (MET) in real-world setting: exploring visual attention of visitors in accommodation facilities. In Consumer Behavior in Tourism Symposium (CBTS 2019), Emotions in Tourism Research: Reflecting on Methodological Approaches. Brunico/Brunek, December 11th -14th 2019.

Further data

Presentations at the following international conferences/workshop

- International Conference on Sustainable Design and Manufacturing, Bologna (Italy), April 26th to 28th, 2017. Presentation titled: "Sustainability as a value-adding concept in the early design phases? Insights from stimulated ideation sessions".
- International Design Conference, Dubrovnik (Croatia), May 21st to 24th, 2018. Presentation titled "A product success scale for supporting research in engineering design".
- International Conference on Sustainable Design and Manufacturing, Budapest (Hungary), July 04th to 05th, 2019. Presentation titled "Eco-Design and Sustainable Development: A Speculation About the Need for New Tools and Knowledge"
- International Conference on Stress Analysis (AIAS), Assisi (Italy), September 4th to 6th, 2019. Presentation titled "Fracture locus of a CORTEN steel: Finite Element calibration based on experimental results"
- TRIZ Future Conference (TFC19), Marrakesh (Morocco), October 9th to 11th, 2019. Presentation titled "Investigating the Value Perception of Specific TRIZ Solutions Aimed to Reduce Product's Environmental Impact"
- International Conference on Materials and Manufacturing Technologies (ICMMT20), Bangkok (Thailand), April 24th to 26th, 2020. Presentation titled "High-Cycle-Fatigue Characterization of an Additive Manufacturing 17-4 PH Stainless Steel"

Further data

- International Conference on Materials and Manufacturing Technologies (ICMMT20), Bangkok (Thailand), April 24th to 26th, 2020. Presentation titled "Low-Cycle-Fatigue Properties of a 17-4 PH Stainless Steel Manufactured via Selective Laser Melting"
- International Conference on Materials and Manufacturing Technologies (ICMMT20), Bangkok (Thailand), April 24th to 26th, 2020. Presentation titled "Satisfaction with and Motivations behind the Use of 3D Printers in Fab Labs: the consequences for Design for Additive Manufacturing"
- International Conference on Stress Analysis (AIAS), Online Event,

September 2nd to 4th, 2020. Presentation titled “Computational studies on cycloidal gearboxes: a systematic literature review”

- International Conference on Sustainable Design and Manufacturing, Budapest (Online Event), September 09th to 11th, 2020. Presentation titled “Bringing success and value in sustainable product development: the eco-design guidelines”
- International Conference on Materials Characterization, Online Event, July 7th to 9th, 2021. Presentation titled “Critical Planes Criteria Applied To Gear Teeth: Which One Is The Most Appropriate To Characterize Crack Propagation?”
- International Conference on Computational Methods and Experimental Measurements, May 25th to 27th, 2021. Presentation titled “Reliable Gear Design: Translation Of The Results Of Single Tooth Bending Fatigue Tests Through The Combination Of Numerical Simulations And Fatigue Criteria”
- TRIZ Future Conference (TFC21), Bolzano (Italy), September 22nd to 24th, 2021. Presentation titled “An Ideality-Based Map to Describe Sustainable Design Initiatives”
- VDI International Conference on Gears 2022, Munich (Germany), September 12th to 14th 2022. Poster presentation titled “A Novel Concept of Nested Cycloidal Speed Reducer”.
- VDI Gleit- und Wälzlagerungen 2023, Schweinfurt (Germany), June 13th to 14th 2023. Presentation titled “Flows in Oil-Bath Lubricated Tapered Roller Bearings: CFD Simulations Validated via PIV”.
- International Symposium on Industrial Engineering and Automation (ISIEA2023), Bolzano, 22nd - 23rd June 2023. Presentation titled “Estimation of Hydraulic Power Losses in a Double-Row Tapered Roller Bearing via Computational Fluid Dynamics”.
- National Workshop of Associazione Nazionale Disegno e Metodi dell’Ingegneria Industriale, Milano (Italy), February 14th to 15th, 2017. Presentation titled: “La sostenibilità come elemento fondamentale di valore nelle fasi preliminari della progettazione”.
- National Workshop of Associazione Nazionale Disegno e Metodi dell’Ingegneria Industriale, Torino (Italy), February 1st to 2nd, 2018. Presentations titled “Le attività del gruppo ING-IND/15 alla Libera Università di Bolzano. Campi di ricerca oggi e nel futuro prevedibile” and “Il successo della progettazione sostenibile: una questione di principio? Indagine empirica della relazione tra i principi di sostenibilità ed il valore percepito”.
- National conference on Tecnologie open source per industria 4.0, Confindustria Firenze (Italy), February 14th, 2020. Presentation titled “Sviluppo di Modelli ad Elementi Finiti per la Progettazione Avanzata di uno Sci da Gara”
- National Workshop on the use of Numerical Analysis in Engineering,

Bolzano, Online Event, March 1st, 2021. Presentation titled: "CFD techniques to study oil flows and power losses in the lubrication of gears and roller bearings"

Other academic achievements and awards

The article "Maccioni, L., & Borgianni, Y. (2019). Investigating the value perception of specific TRIZ solutions aimed to reduce product's environmental impact, 19th ETRIA TRIZ Future Conference, Marrakesh, Morocco, October 9th-11th, 2019" has received the best paper award by the conference scientific committee.

The article "Borgianni Y., Maccioni L., Fiorineschi L., Rotini F., Forms of stimuli and their effects on idea generation in terms of creativity metrics and non-obviousness, International Journal of Design Creativity and Innovation, 8(3), 2020, pp. 147-164" has been designated as Distinguished Paper and recognized among the most read articles of Volume 8 (2020) of the Journal.

The Special Issue "Vibration-Based Health Monitoring of Mechanical Systems" published in Shock and Vibration, edited by Hindawi, of which the Dr. Maccioni is a guest Editor, has been selected by the Journal Editor (Luke Barrett) to become an "Annual Issue."

The work "Flows in Oil-Bath Lubricated Tapered Roller Bearings: CFD Simulations Validated via PIV" presented as Gleit- und Wälzlagerungen 2023 VDI, Schweinfurt, Germany, has been voted as the third best paper of the conference by the program committee.

The article "Maccioni, L., & Concli, F. (2023). Estimation of Hydraulic Power Losses in a Double-Row Tapered Roller Bearing via Computational Fluid Dynamics. In International Symposium on Industrial Engineering and Automation ISIEA 2023" has received the best paper award in mechanical engineering by the conference scientific committee.

Other third-mission activities (disseminations, technology transfer)

Dr. Maccioni has held the 4-hour seminar "Introduzione agli strumenti biometrici nell'ingegneria e nella progettazione" ("Introduction to biometric devices in engineering and design", in Italian) for PhD students, UNIFI, June 21st 2018, in cooperation with Dr. Yuri Borgianni.

Dr. Maccioni has held the 2-hour seminar "(breve) viaggio alla scoperta dell'eye-tracking" ("a short journey to discover eye-tracking", in Italian), for Technical High School students, TFO Max Valier Bolzano, January 18th 2019, in cooperation with Dr. Yuri Borgianni

Other third-mission activities (disseminations, technology transfer)

Dr. Maccioni participated at the event Long Night of Research (LUNA), held in Bolzano in September 2019. Dr. Maccioni presented the Mechanical Lab. Dr. Maccioni has organized a 2-hours of "Eco-Ideation contest" for the Bachelor students of the course "Product Life and Environmental Issues" (Design and Innovation program) at the Technical University of Denmark (DTU), October 21st, 2019.

Dr. Maccioni has spent three weeks (April 25th to May 14th, 2021) at the University of Chalmers, Gothenburg, as a visiting researcher to conduct innovative Particle Image Velocimetry experiments under the supervision of Prof. Valery G. Chernoray.

Dr. Maccioni has spent two weeks (December 10th to December 24th, 2022) at the University of Chalmers, Gothenburg, as a visiting researcher to

conduct innovative Particle Image Velocimetry experiments under the supervision of Prof. Valery G. Chernoray.

Dr. Maccioni has filed the patent number 102022000006671 titled "Riduttore di velocità cicloidale" on April 5th, 2022.

Dr. Maccioni held a 3-days seminar "OpenFOAM® for Engineers" for PhD Student and professionals at UNIBZ on 9th-11th November 2022, in cooperation with professor Franco Concli (UNIBZ) and Professor Augusto Della Torre (POLIMI).

Dr. Maccioni participated to the event ENG LAB DAY for High Schools, held at UNIBZ on 17th January 2023. Dr. Maccioni presented the Mechanical Lab and the Materials Characterization Lab.

**National
Qualification -
ASN**

The judgement reported by the National Evaluation Commission for ASN as regards the qualification for the functions of Associate Professor and published on December 19th, 2023, is reported below in the original language.

"Il candidato ha presentato n. 12 pubblicazioni scientifiche ex art. 7 DM 120/2016, tutte su riviste indicizzate. I lavori scientifici sono coerenti con le tematiche del SSD ING-IND/14 e del SC 09/A3. Il candidato non presenta pubblicazioni a nome singolo ed il numero medio di autori è inferiore a 4. Gli argomenti trattati nelle pubblicazioni consentono di individuare pienamente l'apporto del candidato in tutti i lavori scientifici presentati. Per collocazione editoriale, secondo la banca dati SCIMAGO, 9 sono stati pubblicati su riviste del primo quartile e 3 su riviste di secondo quartile. In merito alle 12 pubblicazioni scientifiche di cui all'art.7 DM 120/2016 presentate dal candidato, le pubblicazioni sono relative al periodo 2019-2023. Le 12 pubblicazioni sono state valutate secondo i criteri di cui all'art. 4 del D.M. 120/2016, da cui si evince che sono da considerarsi di livello buono per la coerenza e la significatività per il SC 09/A3, ed in particolare il SSD ING-IND/14. Degna di nota la pubblicazione n. 3 (Study of the impact of aeration on the lubricant behavior in a tapered roller bearing: innovative numerical modelling and validation via particle image velocimetry) per la buona qualità. Il candidato ha presentato 48 prodotti ai fini degli indicatori, di cui 25 su rivista. Tale produzione è relativa al periodo 2017-2023 ed indica una buona produttività in termini di lavori pubblicati su rivista. Per questi motivi, dopo analitico esame dei titoli e delle pubblicazioni ex art. 7 DM 120/2016, la Commissione unanime ritiene che il candidato abbia raggiunto la maturità scientifica richiesta per le funzioni di Professore di II Fascia e, pertanto, sia IDONEO."

**Language
competence**

Italian, first language; English, B2

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".

Bolzano 15/01/2024