

SHORT CV - 2024

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RESEARCH

- **Simulation Based Design, design and optimization methods of multiphysics systems and foundry equipment:** robust design and optimization of production equipment for material recycling
- **Design Methods (Design for Manufacturing and Assembly, Design for Recycle, Design for Remanufacturing, Design for X):** methods for product and production process development through the integration of different engineering knowledge and design tools.
- **Control and actuation systems for autonomous driving of vehicles:** development of actuators for autonomous driving vehicles
- **Human - Intelligent System integration:** design of Human Centered Systems, development and testing of Advanced Driver Assistance Systems prototypes aimed at comfort and safety.
- **Optimization of energy consumption in robotic manufacturing systems:** parametric modelling and virtual prototyping of the energy consumption of individual robotic operations, discrete event modelling and optimization of the complete robotic system.
- **Methods for Virtual Commissioning and for Hardware In the Loop simulation of automatic machines:** integrated simulation and optimization of mechanical systems, electromechanical devices and control logics.
- **Design Archetypes:** systematic design tools for the knowledge based design of mechanical subsystems.

PROJECTS

- **RecAL - Recycling Technologies for Circular Aluminium:** advanced recycling and digital technologies to facilitate a circular aluminium economy, enabled by the RecAL Hub, a digital cockpit tracking Al-recyclates across the continent, connecting suppliers with buyers. In this way, RecAL will address critical challenges in the industry to usher in a new era of sustainable production – and reuse – for the metal, since 2024.

- **PROSPECTS 5.0:** promote the adoption of Industry 5.0 principles, such as human centricity, sustainability, and resiliency, and facilitate the transition to Industry 5.0 for SMEs, start-ups, and scale-ups in various industries, since 2024.
- **REAL - Robot fLEet for Autonomous vehicle testing:** develop a fleet of robust flat-bots moving soft targets that represent other vehicles or vulnerable road users that could be used to test active Vulnerable Road User protection (e.g. Car-to-Pedestrian scenarios), as well as more complex, dynamic and multi-vehicles scenarios (e.g. Car-to-Car Front Head-On Lane change with 2 vehicles). Fleets of intelligent and synchronized flat-bots could have a great impact in facilitating the creation of dynamic Euro NCAP tests for Advanced Driver Assistance Systems (ADAS) and Autonomous Driving Systems (ADS), since 2024.
- **ECOSISTER - ECOSYSTEM FOR SUSTAINABLE TRANSITION IN EMILIA-ROMAGNA:** Spoke 3 Green manufacturing for a sustainable economy: gripping systems for collaborative robotic solutions for the handling of deformable components characterized by thin-walled flat shapes, since 2023.
- **MO-UAS 4 LIFE: A NEW PERSPECTIVE IN LOCAL URGENT MEDICINE TRANSPORTATION:** design of a drone to transport biomedical material, since 2023
- **PRYSTINE - Programmable Systems for Intelligence in Automobiles:** Fail-operational Urban Surround perceptiON (FUSION) which is based on robust Radar and LiDAR sensor fusion and control functions in order to enable safe automated driving in urban and rural environments, 2018-2021.
- **Sponsorizzazione MMR Driverless Team di Unimore:** from **Robert Bosch S.p.A., Bosch Rexroth S.p.A., Förch, PowerON**, in collaboration with **ATA (Associazione Tecnica dell'Automobile), ANFIA (Associazione Nazionale Filiera Industria Automobilistica), Bosch TEC (Training, Esperienze, Competenze), ETAS, PowerOn - Bosch Motorsport, HERE Technologies**, since 2020.
- **Fonderie Mario Mazzucconi Spa:** foundry equipment design and simulation methods and characterization of material parameters for simulations, since 2019.
- **Academic Agreement con Magma GmbH, Aachen:** training and research in Design by Simulation of foundry equipment, since 2018.
- **ACI Automobile Club Modena:** Efficienza motoria e visiva e sicurezza alla guida, Guidatori in erba alla prova! Progetto ACI per la prevenzione e la sicurezza stradale, 2018.
- **Design for Recycle, per Chimar:** Interventi a favore della ricerca industriale delle imprese operanti nelle filiere maggiormente coinvolte dagli eventi sismici del maggio 2012, 2014-2015.
- **AREUS - Automation and Robotics for EUropean Sustainable manufacturing:** optimization methods for energy saving in robotic systems, 2013-2016.
- **ADAPTIVE - Approccio Modulare ed Adattivo alla Fabbrica Digitale, Cluster Nazionale Fabbrica Intelligente:** methods for robofacturing 2012-2016.
- **Laboratorio LIAM – Laboratorio Industriale Automazione Macchine per il packaging:** development of virtual prototypes for virtual commissioning and software debugging of automatic machines, 2011-2013.

- **Manufacturing Automation Design with Optimized Energy Consumption:** Chalmers University of Technology, Gothenburg, Svezia, and General Motors Technology Center, Warren, MI, USA, 2009-2010.

PUBLICATIONS

- **38 papers:** Scopus indexed, H index 13

- **Editorial Board member:** Human-Intelligent Systems Integration; MDPI Designs; MDPI Hardware; MDPI Machines; IHSI 2020, 3rd International Conference on Intelligent Human Systems Integration: Integrating People and Intelligent Systems, Modena, Italy, 2020; ADM 2019, International Conference on Design Tools and Methods in Industrial Engineering, Modena, Italy, 2019; JCM 2016, International Joint Conference on Mechanics, Design Engineering & Advanced Manufacturing, Catania, Italy, 2016.

- **Scientific board:**

IHSI 2025 Intelligent Human Systems Integration: Integrating People and Intelligent Systems, Roma, Italy; IHSI 2024, Palermo, Italy; IHSI 2023, Dubrovnik, Croatia; IHSI 2022, Venice, Italy; IHSI 2021, Palermo, Italy; IHSI 2019, San Diego, USA; IHSED 2019, 2nd International Conference on Human Systems Engineering and Design: Future Trends and Applications, Munich, Germany; 27th International Conference on Flexible Automation and Intelligent Manufacturing, 2017, Modena, Italy; JCM 2014, Joint Conference on Mechanical, Design Engineering & Advanced Manufacturing, 2014, Toulouse, France; FAIM2013 International Conference on Flexible Automation and Intelligent Manufacturing, 2013, Porto, Portugal.

TEACHING

- **PhD "Enzo Ferrari" in Industrial and Environmental Engineering:** member of the teaching board

- **Progettazione Integrata Computer-Based:** Master Degree in Mechanical Engineering - lecturer from A.A. 2024/2025

- **Design and Modelling of Electronic Systems:** Master Degree in Electronics Engineering - lecturer from A.A. 2024/2025

- **Design Methods:** Master Degree in Automotive Engineering - lecturer from A.A. 2019/2020

- **Fundamentals of design and CAD:** Degree in Automotive Engineering - lecturer from A.A. 2019/2020

- **Faculty Advisor for the Mechanics Division of the Formula Student Driverless Team:** learning by doing, from 2018

- **Foundry Engineering Master Class:** Design by Simulation for foundry equipment seminars in the courses of Technology of Metallic Materials and Design Methods - lecturer from A.A. 2018/2019

- **Industrial Technical Drawing:** Degree in Automotive Engineering - lecturer from A.A. 2018/2019 and Degree in Automotive Engineering for Italian Army - lecturer from A.A. 2011/2012 to 2015/2016 and Degree in Mechanical Engineering - teaching assistant from A.A. 2006/2007 to 2013/2014 and lecturer from A.A. 2014/2015 to 2015/2016

- **Bodywork and Automotive Components Design:** Master Degree in Automotive Engineering - lecturer from A.A. 2012/2013 to 2013/2014
- **Machines Design:** Master Degree in Mechanical Engineering - teaching assistant from A.A. 2007/2008 to 2013/2014
- **Integrated Design Methods:** Master Degree in Mechanical Engineering - lecturer for the A.A. 2011/2012
- **Computer Aided Design:** Degree in Computer Engineering - teaching assistant from A.A. 2008/2009 to 2010/2011
- **Mechanical Standard Parts:** Degree in Mechanical Engineering - teaching assistant from A.A. 2006/2007 to 2009/2010

EDUCATION

- **2010 - Research grant** for the project "Integrated design and virtual prototyping of low-energy industrial robotic systems", Robofactory Design Lab La.PIS, "Enzo Ferrari" Department of Engineering, University of Modena and Reggio Emilia
- **2010 - PhD in High Mechanics and Automotive Design & Technology** - Simulation and Mechanical Design Methods, University of Modena and Reggio Emilia. Thesis: Integrated design methods for intelligent mechanical systems. Tutor: Prof. A.O. Andrisano
- **2009 - Internship at Department of Signals and Systems, Chalmers University of Technology,** Gothenburg, Sweden, for "Manufacturing Automation Design with Optimized Energy Consumption"
- **2006 - Master Degree in Mechanical Engineering,** University of Modena and Reggio Emilia. Thesis: Robust Design Methods for the optimization of an automotive transmission turret. Stage at Union s.r.l., Carpi MO, CAD, CAM, DFMA, quality and control
- **2004 - Mechanical Engineering Degree,** University of Modena and Reggio Emilia. Thesis: Modal analysis and nonlinear dynamics of thin walled structures. Internal project in the Vibration Analysis Laboratory, University of Modena and Reggio Emilia