

# Scientific and Professional Curriculum Vitae

## Marcello Colledani

### Personal Data

Nationality

Place and date of birth

Direction

Fax Number

Work Phone number and email

Codice Fiscale

### Education and Academic Career

- Marcello Colledani started the Mechanical Engineering studies in 1997 in Politecnico di Milano. During the academic year 2001-2002 he studied at Universidad Politecnica de Catalunia in Barcelona, financed by the Erasmus program.
- He **graduated in Mechanical Engineering in 2003**, presenting a work titled "An analytical method for evaluating the performance of multiproduct production systems" supervised by professor Tolio. This work originated a paper that was presented at the Fourth Aegean International Conference on Analysis of Manufacturing Systems, July 1-4 2003, Samos Island, Greece.
- In October 2003 he started the collaboration with the Mechanical Engineering Department at Politecnico di Milano.
- In February 2004 he classified first in the selection for the Phd position at Politecnico di Milano in Manufacturing Technology and Production Systems, XIX cycle, with a governmental grant.
- In May 2006 he classified first in the selection for a permanent position as **Assistant Professor** in the Mechanical Engineering Department.
- In May 2007 **he received his Phd cum laude** in Manufacturing Technology and Production Systems from Politecnico di Milano, presenting a thesis titled "Integrated Analysis of Production Logistics and Quality Performance in Manufacturing Systems".
- In 2008-2009 he spent 1 year as a **visiting professor** at the Laboratory for Manufacturing and Productivity LMP of the **Massachusetts Institute of Technology MIT** in US, carrying on a research activity in collaboration with Prof. Stanley Gershwin. The research activity was sponsored by a grant received from Rocca Foundation.
- Between 2009-2017 he regularly visited the Laboratory for Manufacturing and Productivity LMP at MIT for short term stays, carrying on collaborative research activities with Prof. Gershwin and Prof. Gutowski.
- Between 2012-2019 he has been Research Associate at ITIA CNR, Institute for Industrial Technologies and Automation, where he was responsible for the Recycling Technologies and Systems Cell within the "De-manufacturing" pilot plant.
- In November 2014 he classified first in the selection for a position as **Associate Professor** in the Mechanical Engineering Department.
- In November 2017 he received the National Habilitation for a **Full Professor** position in sector 09/B1 "Tecnologie e Sistemi di Lavorazione".
- In February 2024 he has been selected for a position as **Full Professor** in the Mechanical Engineering Department.

### Teaching Activity

He carried out teaching activities both at bachelor and master level. He collaborated in PhD level courses. The detailed list of activities follows:

Academic Year 2003-2004:

- Teaching assistant for the course "Reconfigurable Manufacturing Systems", 10CFU, dedicated to "Management Engineering" and "Mathematical Engineering" master level students at the Leonardo Campus of Polimi.

Academic Year 2004-2005:

- Teaching assistant for the course “Reconfigurable Manufacturing Systems”, 10CFU, dedicated to “Management Engineering” and “Mathematical Engineering” master level students at the Leonardo Campus of Polimi.

Academic Year 2005-2006:

- Responsible for the course “Reconfigurable Manufacturing Systems”, 10CFU, dedicated to “Management Engineering” master level students at the Como Campus of Polimi. The course language was English (internationalization program).

Academic Years 2006-2007, 2007-2008:

- Responsible for the course “Reconfigurable Manufacturing Systems”, 10CFU, dedicated to “Management Engineering” master level students at the Como Campus of Polimi. The course language was English (internationalization program).
- Responsible for the manufacturing related part of the integrated course “Manufacturing Technology and Metallurgy”, 10CFU, dedicated to “Mechanical Engineering” bachelor level students at the Bovisa Campus of Polimi.

Academic Year 2008-2009:

- Responsible for the course “Reconfigurable Manufacturing Systems”, 10CFU, dedicated to “Management Engineering” master level students at the Como Campus of Polimi. The course language was English (internationalization program).
- Teaching assistant for the course “Reconfigurable Manufacturing Systems”, 10CFU, dedicated to “Management Engineering” and “Mathematical Engineering” master level students at the Bovisa Campus of Polimi.
- Teaching assistant for the course “Manufacturing Technology I” 10CFU, dedicated to “Mechanical Engineering” bachelor level students at the Bovisa Campus of Polimi.

Academic Years 2009-2010, 2010-2011, 2011-2012, 2012-2013, 2014-2015:

- Responsible for the course “Reconfigurable Manufacturing Systems”, 10CFU, dedicated to “Management Engineering” master level students at the Como Campus of Polimi. The course language was English (internationalization program).
- Responsible for the course “Manufacturing Technology I” 10CFU, dedicated to “Mechanical Engineering” bachelor level students at the Bovisa Campus of Polimi.

Academic Year 2013-2014:

- Responsible for the course “Reconfigurable Manufacturing Systems”, 10CFU, dedicated to “Management Engineering” master level students at the Como Campus of Polimi. The course language was English (internationalization program).
- Responsible for the course “Manufacturing Technology I” 10CFU, dedicated to “Mechanical Engineering” bachelor level students at the Bovisa Campus of Polimi.
- Responsible for the lectures on “De-Manufacturing of Mechatronic Components” within the master post-lauream on “Mechatronics”.

Academic Years 2015-2016, 2016-2017:

- Responsible for the course “Demanufacturing”, 5CFU, dedicated to “Management Engineering” master level students at the Bovisa Campus of Polimi. The course language was English.
- Responsible for the course “Production for Made in Italy”, 10CFU, dedicated to “Management Engineering” master level students at the Bovisa Campus of Polimi. The course language was English.
- Responsible for the course “Manufacturing Technology I” 10CFU, dedicated to “Mechanical Engineering” bachelor level students at the Bovisa Campus of Polimi.

Academic Years 2017-2018, 2018-2019:

- Responsible for the course “Demanufacturing”, 5CFU, dedicated to “Management Engineering” master level students at the Bovisa Campus of Polimi. The course language was English.
- Responsible for the course “Manufacturing Technology I” 10CFU, dedicated to “Mechanical Engineering” bachelor level students at the Bovisa Campus of Polimi.

Academic Years 2019-2020, 2020-2021, 2021-2022, 2022-2023, 2023-2024:

- Responsible for the course “Demanufacturing”, 5CFU, dedicated to “Management Engineering master level students at the Bovisa Campus of Polimi. The course language was English.
- Responsible for the course “Manufacturing Technology and Quality” 10CFU, dedicated to “Management Engineering” bachelor level students at the Bovisa Campus of Polimi.

### Supervision of Master and PhD theses

He has been supervisor of:

- 72 master level thesis works, 9 of which in co-supervision with foreign university (1 with MIT, 5 with KTH, Sweden, 1 with University of Bayreuth, Germany, 1 with University Linköping, Sweden, 1 with University of Bristol, UK). The thesis he supervised titled “Flow Analysis and Optimization in Machining Lines - New Models Applied on a Real Industrial Case” by Polato A. and Moriggi P. was awarded with two prizes, one issued by AITEM “Italian Association of Manufacturing Technology” and one issued by UCIMU “Unione Costruttori Macchine Utensili”.
- 6 PhD graduates:
  - Ramiz Assaf, “Analysis of the Output Variability in Manufacturing Systems”, January 2012, graduated with merit.
  - Anteneh Teferi, “Integrated analysis of manufacturing and supervisory systems”, January 2013, graduated with merit.
  - Dariush Ebrahimi “Integrated quality and production logistic performance modeling for selective and adaptive assembly systems”, January 2014, graduated with merit.
  - Ali Jadidi “A Methodology to Support the Modeling and Design of Material Separation Systems for Recycling”, 2015.
  - Nazanin Shabanpour, “Remanufacturing planning under uncertainty”, 2017.
  - Marco Diani, “Cyber-physical system of size-reduction processes to enable cross-sectorial circular economy”, 2021, graduated with merit.

In 2012 he supervised a post-doc researcher (Dr. Malima Wolf) who took her PhD at the MIT and was sponsored by Progetto Rocca for 1 year, and one undergraduate student (Patrick J. Callaghan), also from the MIT.

### Coordination of research groups

Since 2013, Dr. Colledani has been the founder as well as the scientific and technical leader of the “De-and Remanufacturing Technology and Systems” group, spread among Politecnico di Milano and ITIA-CNR (until 2019). The coordinated research group is currently composed of 6 PhD students, 1 Post-doc and 5 researchers.

### Institutional Roles at Politecnico di Milano

- He has been responsible for the autonomous study plans in Mechanical Engineering and the reference person for the track on “Production Systems” within the Mechanical Engineering course, 2013 - 2019.
- He has been member of the PhD Board in the Mechanical Engineering Department from 2020 - 2022.
- Since January 2023, he is member of the Board of the Department of Mechanical Engineering at Politecnico di Milano, with mandate on “Environmental Sustainability and Energy Efficiency” of the Department.

### Research Activity

Dr. Colledani carries on research activities in three main areas:

*I - Modelling, performance evaluation, design and reconfiguration of complex, evolving, manufacturing systems.*

The uncertainty of the market and continuous evolution of technology is pushing manufacturing companies to design and operate systems that continuously change over time to work in the best possible operating conditions. In this highly dynamic context, it is relevant for decision makers to be supported by advanced manufacturing models and tools to quickly and accurately predict in advance the impact of changes on the relevant system performance measures. The research activity in this area aims at modeling and analyzing the performance of production systems characterized by complex information and material flows, in highly stochastic contexts, by using approximate analytical methods and simulation. The main scientific contributions in this area has been:

- ✓ The development of a new “Two-level Decomposition” analytical approach to study manufacturing systems featuring multiple products, assembly/disassembly stations, non-linear flows and rework operations;
- ✓ The development of a new theory for estimating the production quantity variability in stochastic manufacturing systems and to derive management rules to reduce the impact of variability in the system, thus meeting a higher service level from the system;

- ✓ The development of a new method for optimally allocating buffers in multistage production systems to meet the required demand rate from the system, in the long term;
- ✓ The development of a new approach for analyzing systems with machines undergoing generally complex markovian models with a continuous flow analysis. This approach enables to study lines with machines characterized by general distributed disruptions, lines with degrading machines and preventive maintenance.
- ✓ The application of the developed approximate analytical methods to the analysis of real-life systems in the automotive sector with relevant performance improvement results.

All these tools can be used for:

- System performance improvement;
- Driving reconfigurations of changeable and evolvable production systems by forecasting the impact of changes on the system performance;
- Bottleneck analysis, identification, system diagnosis, performance assessment and control;
- Understanding the non-linear behavior of systems characterized by complex material flows.

## II- *Integrated analysis of quality and production logistics performance of manufacturing systems towards zero-defect manufacturing.*

Quality and productivity are typically considered as two separate research areas, concentrating on two different levels of analysis (process and system level), and traditionally studied with different methodologies and tools (e.g. statistical process/quality control and queuing theory). However, the industrial practice shows that quality and production control actions are strongly inter-related and jointly contribute to the achievement of the target performance of a production system. This research activity aims at integrating these areas, providing highly coupled production models and analysis methods to identify improved system configurations that suitably exploit the quality/quantity trade-offs, towards Zero-Defect Manufacturing (ZDM) solutions.

The work of Prof. Colledani in this area focused both on framing the research field and on developing specific methods and tools to operationally support companies in improving their effective throughput and reducing defect rates. Among the first type of works, the contribution has been the formalization of the concept of *production quality*, as the company's ability to timely deliver the desired quantities of products that are conforming to the customer specifications, while keeping resource utilization to a minimum level. Moreover, the most advanced technologies and methods for Zero-Defect Manufacturing and the role of digital technologies to support this industry paradigm have been discussed. These works have contributed to identify a path for future research, aiming at lowering the barriers towards the implementation of ZDM methods in industry.

Among the second type of works, an integrated quality and production logistics model of manufacturing systems has been proposed, grounding on the results achieved in area I, where the dynamic behavior of resources is captured by state-based models of general complexity generated by elaborating on production data. The developed integrated quality and productivity approach at system level made it possible to set the control limits of quality control tools considering the specific impact of the different resources on the performance measures at system level, in presence of both in-line and off-line inspections. These first pioneer works published in this new research area have shown great benefits for companies deriving from the use of the integrated quality-productivity theory at system level. It was shown that there is an impact of the production system architecture on the quality of produced parts. A phenomenon called "system delay in the transmission of the quality control feedback" was demonstrated, that is observed when the machine subject to out of controls is monitored remotely, e.g. in a different downstream stage of the system, such as at the end of the line or off-line. Moreover, the research shows that the presence of the quality control system has an impact of the productivity of the system. Indeed, the stops in the machine production due to quality checks reduce the operational time of the resources in the system. Therefore, configurations obtained without considering these relations are only sub-optimal. Later, preventive maintenance has also been included in this integrated framework. It was shown that preventive maintenance policies that are optimized at single resource level can be highly subperforming at system level. Indeed, the impact of the resource downtime induced by preventive maintenance on the overall system performance varies depending on the position of the bottleneck machine. Other contributions focused on smoothing the propagation of generated defects among sub-sequent stages of a production system. The explored defect management actions included:

- The reworking of identified defective items in-line, thus saving the residual value of the part classified as defect and lowering the cost of poor quality;
- The downstream compensation of component Key Quality Characteristics (KQCs) deviations in assembly, by coupling with a selective, function-oriented, assembly approach the incoming components, preliminarily sorted in quality classes, to smooth their impact on the variability of the assembled product KQCs.

These defect management actions have been modeled and optimized with respect to the operational conditions of the system. Furthermore, the case of perishable, or deteriorating, products where the quality of the part in the system depends on the residence time in the system (e.g. in food, battery, semi-conductor and medical equipment production) has been tackled. The impact of the distribution of the lead time parts spend in the system on the effective production rate has been investigated and modeled, leading to the definition of proper system design and control policies that can smooth the part deterioration and the consequent generation of defective items.

## III - *Modelling and design of de-and remanufacturing technologies and systems for circular manufacturing.*

In recent years, interest in de-and remanufacturing has surged due to both fluctuating material prices and supply as well as international regulation introduced to improve the reuse, remanufacturing, recycling and recovery of post-consumer products and industrial waste, promoting an industrial transition to Circular Economy. In this context, de-and remanufacturing includes the set of technologies and systems, tools and knowledge-based methods to systematically recover, reuse, and upgrade functions and materials from industrial waste and post-consumer products, to support a sustainable implementation of manufacturer-centric Circular Economy businesses. The framing of this vision as well as the review of the most relevant technologies and methods in this field is a first contribution of Prof. Colledani and co-authors in this area. From a technical and operational perspective, the research in this area has been focused both on material recovery strategies, through smart and digitally-enhanced recycling, and on product function recovery strategies through remanufacturing.

Concerning recycling, high value multi-component streams, such as WEEE (Waste Electric and Electronic Equipment), require processing by complex multi-step recycling systems to maximize output material value. The design of these systems is a critical task due to the high volatility of the price of recovered products, the variability in the input material composition and quantities and the increasing pressure towards efficiency of recycling plants. However, the problem of designing multi-stage recycling systems has rarely been tackled from a systems engineering perspective. This research aimed at proposing methods for designing multi-stage mechanical de-manufacturing systems to meet specified performance goals. The developed approach makes it possible to define the best system architecture as a function of the target recovery and grades. Results can be used to generate maps of optimal system configurations for different grade / recovery requirements. The methodology supports applications in the context of advanced modular recycling systems.

Later, Prof. Colledani highlighted that the system engineering perspective calls for an integration among process level models and system level models. Indeed, the flow rate of materials affects the separation quality that, in turn, affects the flow rates directed to the output system branches. A multi-scale modeling architecture for these interacting layers has been proposed, also grounding on the results achieved area I. At system level, aggregated models of the material flow through the multiple stages of mechanical recycling systems are adopted. At process level, detailed models of the process physics are developed, such as advanced multi-body, multi-particle simulation models, able to capture the impacts between particles in the process, have been developed, for example for Electrostatic and Eddy Current separation. The integration between these two levels has enabled, for example, to develop optimization algorithms to set the parameters of the shredding processes in order to guarantee a desired level of grade of the downstream separation processes, solving the trade-off existing between particle size and particle liberation degree.

Grounding on this vision and methodologies, novel recycling solutions have been investigated by the group of Prof. Colledani, specifically applied to currently poorly recycled but strategic components, with particular focus on the e-mobility sector, such as Li-Ion batteries, electronics and composite materials:

- For Li-ion batteries, after an in depth analysis of the state-of-the-art on recycling approaches, solutions and recovery rates, the group of Prof. Colledani has been concentrating on developing a novel technological solution for cutting the battery cell case, extracting the electrolyte and the active battery winding and mechanically pre-treating the active roll for higher selectivity of materials, thus supporting closed loop recycling and re-use of the output fractions.
- For electronics, a novel Cyber-Physical System for controlling the size-reduction process and obtaining output material streams with repeatable characteristics has been developed, compounded by improved separation and in-line material characterization solutions, e.g. through Hyperspectral Imaging.
- For composite materials, both glass and carbon fiber reinforced polymers, a novel cross-sectorial and demand-driven circular approach has been proposed, demonstrating the feasibility of re-using the recycled fractions within different applications, provided that the input specifications are met (See the FiberEUse book).

These technologies are currently in the phase of industrialization and market uptake within different projects and start-ups (e.g. FiberEUse Tech, founded by Prof. Colledani). Concerning product function retain through remanufacturing, Prof. Colledani has contributed proposing a novel digital solution and method for disassembly planning based on quality class based sorting of collected post-use products (cores) before remanufacturing, thus considering the intrinsic variability of conditions of returning products. Moreover, a modular digital tool to simulate remanufacturing process-chains before the industrial implementation of this circular business strategy has been deployed. All in all, the adopted research strategy aims at increasing the regeneration rates of remanufacturing operations. The proposed recycling and remanufacturing solutions could further benefit from the introduction of the Digital Product Passport (DPP), introduced in the ESPR regulation at European level (European Regulation on Sustainable Products), currently under investigation within the Cirpass and DigiPrime European projects.

### **Scientific and Technical Responsibility of Laboratories**

Between 2013 and 2019, Prof. Colledani was responsible of the “Mechanical Recycling Cell” that was one of the three sections of the “**Mechatronics De-manufacturing Pilot Plant**”, installed at ITIA-CNR in 2013. He was also the designer of the laboratory which included two size-reduction machines, several mechanical separation technologies, a hybrid flexible mixture transportation system and hyperspectral imaging for in-line mixture characterization and quality control.

Since 2019 Prof. Colledani has scientific leadership and responsibility of the Inter-departmental Laboratory “**CIRC-eV: Circular Factory for the Electrified Vehicles of the Future**”, involving seven Departments at Politecnico di Milano and focused on new technological solutions for testing, disassembly, and re-assembly of Li-Ion batteries from electrified vehicles of the future, in view of second use applications. Located in the Mechanical Engineering department, the mission of the CIRC-eV Laboratory is to develop a new concept of Circular Factory to support the manufacturing industry in the recovery and reuse of functions and value from post-use Hybrid and Electric Vehicles, boosting the introduction of new circular economy models for sustainable e-mobility. Being LIBs the most critical component of EVs, they are particularly addressed in the lab. State-of-the-art technologies for the characterization, disassembly, reassembly and mechanical recycling of e-mobility LIBs are available in the laboratory, designed by Prof. Colledani and his group.

Since 2020 Prof. Colledani has scientific responsibility of the Lombardy Region Hub for Circular Economy “**Eco-Circ: Accordo di collaborazione per la realizzazione di un’innovativa infrastruttura pilota regionale di supporto alla transizione verso l’economia circolare**” involving five research institutes and Universities in the Lombardy Regions, among which Stiima-CNR, University of Pavia, University of Milan, and the University of Milan Bicocca, and four Departments at Politecnico di Milano. The hub involves 5 MEuro of infrastructure co-funding granted by the Lombardy Region for increasing the capacity of research institutes in Lombardy while supporting the Lombardy Region industrial stakeholders in the transition to circular business cases. Polimi, as the coordinator of this initiative, is building a 3.2 MEuro infrastructure for supporting circular economy solutions in the e-mobility, thus expanding the technical capabilities of the CIRC-eV laboratory towards other key e-vehicle components, such as composite and techno-polymers, lightweight metal parts, mechatronics and electronics. Prof. Colledani is the coordinator of the Politecnico di Milano team as well as the coordinator of the overall Eco-Circ initiative at Regional level.

### International Associations and Networks

- Since 2005 he is member of the Italian Association for Manufacturing Technology (AITEM).
- Since 2006 he has been involved in scientific and organizational activity of the CIRP Working Group named SPECIES-Production Systems Evolution, launched and lead by Prof. Tolio. A CIRP Keynote Paper was published in 2010, which disseminates the results of the activities carried out in the SPECIES working group.
- Since 2006 he is active in the IFAC, International Federation of Automatic Control, as Affiliate.
- Between 2010-2014 he has been Research Affiliate of the CIRP - International Academy for Production Engineering, as part of the Italian Delegation.
- Since 2012 he is funding member of the Technical Committee TC "Sustainable Production Automation" in the IEEE Robotics and Automation Society.
- In Year 2014 he was among the founding members of the European Cluster “4ZDM - Zero Defect Manufacturing”.
- Since 2014 he is member of the Technical Committee on “Sustainable manufacturing” at the Italian “Intelligent Factory” Cluster, CFI.
- Since 2014 he is part of the Roadmapping team of the Italian “Intelligent Factory” Cluster, CFI.
- Since 2014 Prof. Colledani is the coordinator of the "De-and Remanufacturing for Circular Economy" working group within AFIL, involving Regional industrial stakeholders and RTOs in the field of circular economy at Lombardy Region level. The group regularly meets every month to share best practices and R&D&I needs in the area of Circular Economy. The work within these group has originated the concepts of three funded H2020 European projects namely FiberEUse, CarE-Service and Screen.
- Since 2015, he is member of the Steering Committee of the ESM-Efficient and Sustainable Manufacturing Pilot within the Vanguard Initiative "New Growth Through Smart Specialization".
- Since 2015, Prof. Colledani is the coordinator of the Vanguard Initiative "De-and Remanufacturing" for Circular Economy demo-case, on behalf of Regione Lombardia and AFIL, involving more than 100 European stakeholders. The demo-case aims at creating a network of pilot plants, distributed in ten European Regions (Lombardy, Scotland, Saxony, Tampere, Basque Country, Norte, Flanders, Emilia Romagna, Wallonia, Slovenia) designed to deliver services to industrial stakeholders by leveraging on multi- regional synergies and complementarities, with the goal of de-risking private investments in innovative and emerging Circular Economy businesses. This pilot network will act as innovation hub for circular economy, including a network of competence and technology centers and supporting future producer-driven replication at industrial scale. This ambitious project has been discussed with the EIB during a restricted meeting in Luxembourg in July 2016, aiming at assessing the bankability of the business model. Moreover, this initiative has been selected among the eight “DG Regio pilot actions” in 2018 and received support from the TAF services promoted by DG Grow in 2019.

- Between 2014-2021 he has been Associate Member of the CIRP - International Academy for Production Engineering, as part of the Italian Delegation.
- Since 2018 he is funding member and Coordinator of the Scientific Board of the Manufuture Sub-platform on “Zero Defect Manufacturing”, with the role of developing a SRA - Strategic Research Agenda for Zero-Defect Manufacturing in Europe (<https://zdmanufuture.org>).
- Since 2019 he is responsible for the Circular Economy Roadmapping group within the Lombardy Region and the main author of the 2020 Lombardy Region Roadmap on Circular Economy.
- Since 2019 he is member of the Board of Directors of APRA-Europe, Automotive Part Remanufacturing Association.
- Since 2019 he is representing Politecnico di Milano as an Academic Member of the Ellen Mac Arthur Foundation Network.
- Since 2020 he is representing Politecnico di Milano as an Academic Member of the BEPA – Battery European Partnership Association, the private entity of the European Public Private Partnership Batt4EU, elaborating the text of the calls for the workprogram on batteries at EU level. Between 2021-2022 he has been co-chair of the Technical Working Group TWG 1 of the BEPA on “Raw Materials and Recycling”.
- Since 2021 he is Fellow of the CIRP - International Academy for Production Engineering, as part of the Italian Delegation.
- Since 2022 he is co-chair of the Batteries Europe / BEPA Task Force on Sustainability.
- Since 2023, he is representing Politecnico di Milano as an Academic Member of the Upcell Alliance.

#### **Technical and Scientific Committees**

- In 2009 he was member of the organizing committee of the SMMSO09 “International Conference on Stochastic Models of Manufacturing and Service Systems” held in Lecce, Italy.
- In 2010 he was member of the scientific committee of ETFA2010 “Emerging Technologies and Factory Automation” September 13-16, 2010, Bilbao, Spain, in Track 4 on “Automated Manufacturing Systems”.
- In 2013, 2019, 2020, 2021, 2022, 2023 he has been member of the Scientific Committee of the CIRP Conference on Manufacturing Systems (CIRP CMS).
- In 2013 and 2014 he has been member of the scientific committee of the VALUETOOLS International Conference on Performance Evaluation Methodologies and Tools.
- In 2013 he was the co-organizer of the First Workshop on “Hyperspectral Imaging Applications and Opportunities for environment, sustainability and recycling” that was held in Milan on May 23<sup>rd</sup>, 2013.
- In 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 he has been member of the scientific committee of the CIRP DESIGN Conference.
- In 2015 he was member of the scientific committee of the MESIC Conference 2015 that was held in Barcelona, Spain.
- In 2017 he was member of the scientific committee of the International Conference on Sustainable Design and Manufacturing, SDM2017, held in Bologna in April 2017.
- On July 1<sup>st</sup> 2018 he was appointed as member of the Editorial Board of the International Journal of Computer Integrated Manufacturing (IJCIM).
- In 2019, 2020, 2021, 2022, 2023 he has been member of the Scientific Committee of the CIRP LCE Life-Cycle Engineering Conference.
- In 2020 he was the chairman of the “World Remanufacturing Summit”, co-organized by Politecnico di Milano and the Lombardy Region, 2-3 March 2020, canceled due to the Covid-19.
- He co-organized and hosted the "Batteries Europe" Raw Materials and Recycling workshop at Polimi in Milan, in June 2019, organizing stakeholders’ workshops for identifying R&I challenges.
- Since 2022 he is member of the Editorial Team for the journal Frontiers in Chemistry on the Research Topic "The challenge towards more sustainable lithium-ion batteries: from their recycling, recovery and reuse to the opportunities offered by novel materials and cell design".
- Since 2022, he is member of the Editorial Board of the Green Manufacturing Open, OAE Publishing Inc.

## Research Projects

He is involved in several research projects, both at National and European level.

### Projects with the role of Project Coordinator

- **H2020 FoF-03-2016: “ForZDM, Integrated Zero Defect Manufacturing Solution for High Value Adding Multi-stage Manufacturing systems”, GA n° 723698**, funded by the European Commission under the call “Zero-defect strategies at system level for multi-stage manufacturing in production lines”. From 1/10/2016 al 30/9/2020. The total funded activity for Polimi amounted to 617000 Euro.

Marcello Colledani was part of the core writing team of the proposal. He had scientific responsibility and coordination role of the Polimi team in this project. He was workpackage leader in this project. He became the **Project Coordinator** in 2020, after the previous project coordinator GKN left the project.

In particular, he led WP5: “System-level zero defect manufacturing solution” that sees the participation of the following partners: NxtControl (AT), Enginsoft (IT), Masmec (IT), Tecnalìa (SP), Ideko (SP), University of Stuttgart (GE). Moreover, Prof. Colledani is Editor of the book that originated from ForZDM, titled Colledani M., Caputo D., Arrieta, J., “Zero-Defect Manufacturing for the Factory of the Future”. The book is in publication and expected by the end of 2023, published by Springer within the Springer Tracts in Mechanical Engineering.

- **H2020 CIRC-01-2016: “FiberEUse - Large scale demonstration of the techno-economical benefits of new circular economy value-chains based on the reuse of end-of-life fiber reinforced composites”, GA N° 730323**, funded by the European Commission under the call “Systemic, eco-innovative approaches for the circular economy: large-scale demonstration projects”. From 1/6/2017 to 31/5/2021. The total funded activity for Polimi amounts to 1’100’000 Euro.

The project involves 21 partners over 7 European Countries with a total funding of €9,800,000 Euro and had a duration of 4 years. The project aims at developing eight innovative demonstration products re-using recovered glass and carbon reinforced plastics to be introduced in the market, where the economic viability is supported by a circular economy oriented, cross-sectorial value-chain approach.

Marcello Colledani was part of the core writing team of the proposal. He had scientific responsibility and coordination role of the Polimi team in this project. **He was the Project Coordinator.**

- **H2020 DT-ICT-07-2019: “DigiPrime - Digital Platform for Circular Economy in Cross-sectorial Sustainable Value Networks”, GA n° 873111**, funded by the European Commission under the call “Digital Manufacturing Platforms for Connected Smart Factories”. From 1/01/2020 to 31/12/2024. The total funded activity for Polimi amounts to 1’031’000 Euro.

The project involves 36 partners over 11 European Countries with a total funding of €15,963,173 Euro and has a duration of 4 years. The objective is to develop a new concept of Circular Economy digital platform overcoming current information asymmetry among value-chain stakeholders, in order to unlock new circular business models based on the data-enhanced recovery and re-use of functions and materials from high value-added post-use products with a cross-sectorial approach.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project. **He is the Project Coordinator.**

- **I3-2021-INV1-MANU: “DeremCo - De-and Remanufacturing for Circular Economy Investments in the Composite Industry”, GA n° 101084037**, funded by the European Commission under the call “Interregional Innovation Investments (I3), Strand 1”. From 1/12/2022 al 30/11/2025. The total funded activity for Polimi amounts to 499’000 Euro.

The project involves 30 partners over 7 European Regions with a total funding of €8,822,751 Euro and has a duration of 3 years. DeremCo aims to create a systemic, cross-sectorial, demand-driven circular economy solution that will enable the cost-effective reuse of post-use composite materials and components in new high-added value products. This solution will be based on the interaction between the technical and social eco-systems at the local and interregional level and will benefit the environment, industry, consumers, and the European society.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project. **He is the Project Coordinator.**

- **I3-2022-INV1-MANU, “Batmass - EU circular BAttery valley for second life, recycling, and re-manufacturing of materials and black mass”,** funded by the European Commission under the call “Interregional Innovation Investments (I3), Strand 1”. From 01/09/2023 to 31/3/2026. The total funded activity for Polimi amounts to 565’692 Euro.



The project involves 21 partners with a total funding of €9,765,023.84 Euro and has a duration of 30 months. BATMASS aims to implement the first EU Circular Battery Valley. It offers a portfolio of cross-regional investments in TRL6+ innovations in circular technologies and processes for battery materials. It taps into the innovation power of RTOs and SMEs to accelerate market entry and international replication across EU regions and beyond. Tech transfers between less developed, transition and developed regions is expected to structure this emerging value chain and anchor it into regional innovation ecosystems.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project. He is the Project Coordinator.

- **HORIZON-CL5-2023-D2-01-03 “BATTwin - Flexible and scalable digital-twin platform for enhanced production efficiency and yield in battery cell production lines”, GA n° 101137954**, funded by the European Commission under the call “Advanced digital twins for battery cell production lines (Batt4EU Partnership)”. From 01/12/2023 to 31/5/2027. The total funded activity for Polimi amounts to 761'000 Euro.

The project involves 16 partners with a total funding of €6,335,218.75 Euro and has a duration of 42 months. The objective of BATTwin is to develop a novel Multi-level Digital Twin platform towards Zero-Defect Manufacturing in battery production, that will reduce defect rates in battery production lines. The solution integrates four pillars, namely (i) a multi-sensor data acquisition and management layer, supported by data semantics through a Digital Battery Passport data model, (ii) process-level digital twins, modeling the critical stages of electrode manufacturing, cell assembly and conditioning through multi-physics, data-driven and hybrid approaches, (iii) system-level digital twins, based on simulation and analytical modeling, (iv) user-centric, goal-driven digital twin workflows, increasing the explainability of digital twins and driving the user in system design and control.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project. He is the Project Coordinator.

- **HORIZON-CL4-2023-HUMAN-01-53, “YouRban - Urban cocreative, sustainable and inclusive ecosystem, for the recycling of reinforced polymers on-the-truck”, GA n° 101135997**, funded by the European Commission under the call “Localised and Urban Manufacturing, supporting creativity and the New European Bauhaus”. From 01/12/2023 to 31/5/2026. The total funded activity for Polimi amounts to 936'750 Euro.

The project involves 8 partners with a total funding of €2,469,385 Euro and has a duration of 30 months. YouRban is engaged in the New European Bauhaus and the Green Deal principles of aesthetic and environmental balance, alongside sustainability and inclusion parameters, through regenerative design and manufacturing, encouraging dialogue across cultures, disciplines, professions, genders, and ages. A local and flexible decentralized production system is generated in two European cities, both linked to the Climate-Neutral and Smart Cities EU Mission, Milan and Barcelona. Two complementary pilots will cocreate new objects through a Neighbourhood Participatory Approach supported by Collaborative Digital tools.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project. He is the Project Coordinator.

#### **Other Ongoing Projects**

- **H2020-MSCA-ITN-2018, “Digiman 4.0 - MANufacturing Technologies for Zero-defect Industry 4.0 Production”, GA n° 814225**, funded by the European Commission under the Marie Curie program. From 1/01/2019 al 31/12/2022. The total funded activity for Polimi amounts to 784'000 Euro, including the support to three ESRs.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project. He is workpackage leader in this project and supervisor of one ESR.

In particular, he led WP4: “Industry 4.0 Zero-defect Pilot Production” with the participation of all the project partners.

- **H2020-NMBP-TR-IND-2020, “DAT4-ZERO - Data Reliability and Digitally-enhanced Quality Management for Zero Defect Manufacturing in Smart Factories and Ecosystems”, GA n° 958363**, funded by the European Commission under the call “Quality control in smart manufacturing”. From 1/8/2020 to 31/7/2024. The total funded activity for Polimi amounts to 575'625 Euro.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project. He is the Scientific Coordinator of the whole project consortium.

- **CE-SC5-31-2020, “Trick - Product Data Traceability Information Management by Blockchains Interoperability and Open Circular Service Marketplace”, GA n° 958352**, funded by the European Commission under the call “Develop, implement and assess a circular economy-oriented product information management system for complex products from cradle to cradle”. From 1/3/2021 to 28/2/2024. The total funded activity for Polimi amounts to 327'000 Euro.

He has scientific responsibility and coordination role of the Polimi team in this project. He is also the Scientific Coordinator and Quality Manager of the whole project consortium.

- **HORIZON-CL4-2021-RESILIENCE-01-01, “Recreate - REcycling technologies for Circular REuse and remanufacturing of fiber-reinforced composite mATERials”, GA n° 101058756**, funded by the European Commission under the call “Ensuring circularity of composite materials”. From 1/6/2022 to 31/5/2026. The total funded activity for Polimi amounts to 996’250 Euro.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi Mechanical Engineering Department team in this project.

- **DIGITAL-2021-TRUST-01-DIGPASS, “Cirpass - Collaborative Initiative for a Standards-based Digital Product Passport for Stakeholder-Specific Sharing of Product Data for a Circular Economy”, GA n° 101083432**, funded by the European Commission under the call “Digital Product Passport: sustainable and circular systems”. From 1/10/2022 to 31/3/2024. The total funded activity for Polimi amounts to 150’000 Euro.

Marcello Colledani was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi Mechanical Engineering Department team in this project. He is workpackage leader in this project.

In particular, he led WP3: “DPP System and Framework Architecture” with the participation of the following partners: GS1 (UK), Ercim (FR), CEA (FR), DKE (GE), iPoint (GE), GTS (GE), Circular Fashion (GE), DigitalEurope (BE).

- **HORIZON-CL4-2021-TWIN-TRANSITION-01-07, “Circular Twain - AI Platform for Integrated Sustainable and Circular Manufacturing”, GA n° 101058585**, funded by the European Commission under the call “Artificial Intelligence for sustainable, agile manufacturing”. From 1/7/2022 to 30/6/2025. The total funded activity for Polimi amounts to 481’250 Euro.

He has scientific responsibility and coordination role of the Polimi Mechanical Engineering Department team in this project.

- **HORIZON-CL4-2022-TWIN-TRANSITION-01-01, “RaRe2 - Human-centred Rapid Reconfiguration of Production and Value Chain in Fast Changing Scenarios”, GA n° 101092073**, funded by the European Commission under the call “Rapid reconfigurable production process chains”. From 1/12/2022 to 31/5/2026. The total funded activity for Polimi amounts to 589’375 Euro.

He has scientific responsibility and coordination role of the Polimi team in this project. He is workpackage leader in this project.

- **HORIZON-CL4-2022-TWIN-TRANSITION-01-07, “DaCapo - Digital assets and tools for Circular value chains and manufacturing products”, GA n° 101091780**, funded by the European Commission under the call “Digital tools to support the engineering of a Circular Economy”. From 1/01/2023 to 30/06/2026. The total funded activity for Polimi Mecc Dept. amounts to 260’000 Euro.

He has scientific responsibility and coordination role of the Polimi Mechanical Engineering Department team in this project.

- **I3-2021-INV2a-MANU, “SMART-Growth - Artificial intelligence enhanced, sustainable growth of rare-earth materials based laser crystals”, GA n° 101115130**, funded by the European Commission under the call “Interregional Innovation Investments (I3), Strand 2a”. From 01/09/2023 to 31/12/2025. The total funded activity for Polimi amounts to 153’956.95 Euro.

He was part of the core writing team of the proposal. He has scientific responsibility and coordination role of the Polimi team in this project.

#### **Other Past Projects**

- European Community 6<sup>th</sup> FP project. **Network of Excellence VRL KCiP** – Virtual research Lab for Knowledge Community in Production. The role of Dr. Colledani in this project has been both scientific and coordination of the team at Politecnico di Milano.
- National project PRIN 2005 “Methodologies and tools to plan production capacity with focused flexibility”. He had scientific role in this project.
- **Roberto Rocca seed fund grant** “Interactions Among Quality and Productivity Performance Measures in Production Systems”, 2006, in collaboration with Prof. Gershwin from the MIT Laboratory for Manufacturing and Productivity. He had scientific role in this project.
- **Mechanical Engineering Department project** – “Model, Design and Control of Eddy Current Material Separation Systems (ECS) for car scraps recycling”, 2010. He was principal investigator.

- **FP7 INFRA-2010-1.1.29 “Visionair – Vision, Advanced Infrastructure for Research”, GA n° 262044**, funded by the European Commission Call 2 Advanced Digital Visualisation Facilities”, 7th Framework Program. From 1/02/2011 to 31/01/2015. He had scientific role in this project.
- **FP7 FoF.NMP.2011-5: “MuProD - Innovative proactive Quality Control system for in-process multi-stage defect reduction”, GA n° 285075**, funded by the European Commission Call “Towards zero-defect manufacturing”, 7th Framework Program. From 1/11/2011 al 30/10/2014. The total funded activity for Polimi amounted to 642'675.89 Euro.

Marcello Colledani was part of the core writing team of the proposal. He had scientific responsibility and coordination role of the Polimi team. He was workpackage leader and the Scientific Coordinator of the whole project consortium.

In particular, he led WP5: “Development of new integrative solutions for proactive quality control in multi-stage systems” with the participation of the following partners: Tecnalìa (ES), University of Stuttgart (GE), Bosch (GE), ENKI (IT), EPFL (CH), Trimek (ES), IBM (IS), Technion (IS), Marposs (IT), Gamesa Eolica (ES).

- **FP7-2011-NMP-ICT-FoF: “RLW Navigator - Remote Laser Welding System Navigator for Eco & Resilient Automotive Factories”, GA n° 285051**, funded by the European Commission Call “Digital factories: Manufacturing design and product lifecycle management”, 7th Framework Program. From 1/1/2012 al 31/12/2014. The total funded activity for Polimi amounted to 631'331 Euro.

He had scientific responsibility and coordination role of the Polimi team. He was workpackage leader in this project.

In particular, he led WP1: “Production System Configuration” with the participation of the following partners: Jaguar-Land Rover (UK), Warwick University (UK), Comau (IT), Enginsoft (IT), EPFL (CH), Stadco (UK).

- **Italian Flagship Project – “Factory of the Future” 2012. “Integrated Technological Solutions for Zero Waste Recycling of Printed Circuit Boards (PCBs) - Zero Waste PCBs”.**

Marcello Colledani was part of the core writing team of the proposal. He had scientific role in this project. He was leader of the workpackage 4 “Separation process modelling and simulation” and of the workpackage 11 on “Separation process control and validation” in this project.

- **FP7 FoF.NMP.2013-9: “RobustPlaNet, Shock-robust Design of Plants and their Supply Chain Networks”, GA n° 609087**, funded by the European Commission Call “Advanced concepts for technology-based business approaches addressing product-services and their manufacturing in globalised markets”, 7th Framework Program. From 1/10/2013 al 31/9/2016. The total funded activity for Polimi amounted to 446850 Euro.

Marcello Colledani was part of the core writing team of the proposal. He had scientific responsibility and coordination role of the Polimi team in this project. He was workpackage leader in this project.

In particular, he led WP2: “Technical solutions for shock-robust plants” with the participation of the following partners: Daimler (GE), KIT (GE), Festo (GE), MCM (IT), Marposs (IT), Stzaki (HU), Knorr Bremse (HU), ITC (HU).

- **2013 Italian project “FIDEAS – Intelligent Factory for the Advanced and Sustainable De-manufacturing”.**

Marcello Colledani was part of the core writing team of the proposal. He had scientific role in this project. He was leader of workpackage 4 on “Advanced recycling Processes”.

- **Italian Flagship Project – “Factory of the Future” 2012. “WEEE Reflex - Highly Evolvable E-waste Recycling Technologies and Systems”.**

Marcello Colledani was part of the core writing team of the proposal. He had scientific responsibility and coordination role of the Polimi team in this project. He was leader of workpackage 2 on “Design and Control of Modular and Evolving Recycling Systems” and of workpackage 3 on “Separation Process Optimization and Control” in this project.

- **H2020 FoF-05-2014: “ProRegio - Customer-driven Design of Product-services and Production Networks to Adapt to Regional Market Requirements” GA 636966**, funded by the European Commission under the call “Innovative Product-Service design using manufacturing intelligence”. From 1/1/2015 al 31/12/2017. The total funded activity for Polimi amounts to 547750 Euro.

Marcello Colledani was part of the core writing team of the proposal. He had scientific responsibility and coordination role of the Polimi team in this project. He is workpackage leader in this project.

In particular, he led WP4: “Process and plant design for product-service innovation” with the participation of the following partners: KIT (GE), Comau (IT), Enginsoft (IT), Ecole Centrale de Nantes (FR), Audros (FR), Airbus (GE), Flexis (GE), TeXXmo (GE), Gizelis Robotics (GR), Arcelik (TK).

- **H2020 FoF-07-2014: “Focus - Factory of the Future Clusters” GA 637090.** Coordination and Support Actions (CSA), funded by the European Commission under the call “Support for the enhancement of the impact of FoF PPP projects”.

Marcello Colledani was coordinating the expert group and the industrial advisory group in this CSA.

- **H2020 FoF-11-2015: “Recam - Rapid Reconfiguration of Flexible Production Systems through Capability-based Adaptation, Autoconfiguration and Integrated tools for Production Planning”, GA N° 680759,** funded by the European Commission under the call “Flexible production systems based on integrated tools for rapid reconfiguration of machinery and robots”. From 1/11/2015 al 31/10/2018. The total funded activity for Polimi amounted to 609375 Euro.

Marcello Colledani was part of the core writing team of the proposal. He had scientific responsibility and coordination role of the Polimi team in this project. He was workpackage leader in this project.

In particular, he led WP4: “Flexible Production System Engineering and Reconfiguration Management” with the participation of the following partners: Bosch (Ge), NxtControl (AT), CESA (SP), DGH (SP), Cosberg (IT), Enginsoft (IT), Tecnalina (SP), Tampere University of Technology (FI).

- **Italian Flagship Project – “Factory of the Future” 2015. “WEEE ReFlex CPS - Cyber-Physical System (CPS) for reconfigurable e-waste recycling processes”.**

Marcello Colledani was part of the core writing team of the proposal. He had scientific role in this project.

- **Italian Flagship Project – “Factory of the Future” 2015. “PCB-ID - In-line automated device for the identification of components and the characterization of materials and value in waste PCBs”.**

Marcello Colledani was part of the core writing team of the proposal. He had scientific role in this project.

- **Italian Flagship Project – “Factory of the Future” 2015. “ShredIT - Self-Optimizing Shredding Station for Demanufacturing Plants”.**

Marcello Colledani was part of the core writing team of the proposal. He had scientific role in this project.

- **2013 Italian Cluster Intelligent Factory – “Project 1: Sustainable Manufacturing”.**

Marcello Colledani was part of the core writing team of the proposal. He was the scientific coordinator of the “Target Objective” on “De-manufacturing” within this project. He had scientific responsibility and coordination role of the Polimi team in this project.

- **H2020 CIRC-03-2016: "Screen - Synergic Circular Economy across European Regions", GA n° 730313,** funded under the call topic "Smart Specialisation for systemic eco-innovation/circular economy". The total project funding amounts to 1771865. It is a Coordinated and Support Action (CSA). From 01/11/2016 to 31/10/2018.

He had Scientific Role in the project and scientific responsibility for the party AFIL - Associazione fabbrica Intelligente Lombardia, as linked third party of the partner Lombardy Region.

- **H2020 ECSEL-2016-2 Joint Undertaking: “Productive 4.0: A European co-funded innovation and lighthouse project on Digital Industry”, GA n° 737459,** funded by the European Commission as part of the ECSEL program. From 1/5/2017 to 30/4/2020. The total funded activity for Polimi amounts to 500’000 Euro.

He had scientific responsibility and coordination role of the Polimi team in this project.

- **“CyberSort– In-line identification and automatic sorting for high-efficiency circular economy solutions”** funded by the Lombardy Region project and coordinated by ITIA-CNR. The total funding amounted to €1’037’000.

Marcello Colledani was part of the core writing team of the proposal and had scientific role in this project.

In particular, he was the leader of activity 1.1 on “Analysis and identification of waste matrices and their variability”, of activity 1.2 "Waste material characterization by multi-sensor hyperspectral imaging solutions”, and of activity 3.1 "In line control of size-reduction processes” in this project and actively involved in the demonstration activities.

- **“SmartLed - Multi-sensor System for End-of-life LED lamps treatment”,** funded by the Italian Ministry of Environment, total funding amounts to 150’000 Euro.

Marcello Colledani was part of the core writing team of the proposal and had scientific role in this project.

- **H2020 CIRC-01-2017, “Car-E Service - Circular Economy oriented services for re-use and remanufacturing of hybrid and electric vehicles components through smart and movable modules”, GA n° 776851,** funded by the European Commission under the call “Systemic, eco-innovative approaches for the circular economy: large-scale

demonstration projects” and coordinated by ITIA-CNR (Dr. Giacomo Copani). From 1/6/2018 to 31/5/2022. The total funded activity for ITIA-CNR amounted to 850'000 Euro. The total project funding amounted to €6'200'000.

He was part of the core writing team of the proposal and had scientific role as part of the ITIA-CNR team. He also acted as Technology Manager for this project and member of the Steering Committee.

- **Technical Support for ITIA-CNR to the Lombardy Region within the Interreg Project CircE.** Prof. Colledani and the ITIA-CNR team provided technical assistant, supported by a grant, to the Lombardy Region, for the coordination of the Interreg Project CircE “European Regions towards Circular Economy” since 2017.
- **Tender ADMA - Access for SMEs to advance manufacturing support,** funded by the EASME/COSME/2017/018 tender call. Prof. Colledani is technical reference for the Lombardy Region Cluster on Intelligent Factory AFIL for this project, aiming at defining a methodology for supporting European SMEs in the identification of feasible trajectories for a transition to new industry 4.0 enabled industrial models. Total amount for AFIL is 130'000 Euro.
- **H2020-NMBP-FOF-2018, “Iqonic - Innovative strategies, sensing and process Chains for increased Quality, re- configurability, and recyclability of Manufacturing Optoelectronics”, GA n° 820677,** funded by the European Commission under the call “Innovative manufacturing of opto-electrical parts”. From 1/10/2018 al 31/3/2022. The total funded activity for Polimi amounted to 511250 Euro.

He had scientific responsibility and coordination role of the Polimi team in this project. He was workpackage leader in this project.

In particular, he led WP5: “Defect Life-Cycle Management, Disassembly and Remanufacturing” with the participation of the following partners: Prima Electro (IT), Holonix (IT), TU (FI), Atlantis (GR), Filar Optoelectronics (IT), Ficontec (GE), Alpes Lasers (CH).

#### **Titles, Awards and Acknowledgments**

- In 2006 he received the **Best Young Author Prize** by the 12th IFAC Symposium on Information Control Problems in Manufacturing, INCOM 2006 for the paper Colledani M., Tolio T. “Performance Evaluation of Production Systems Monitored by Statistical Process Control and Offline Inspections”.
- In 2007 he was **invited speaker at the DMMS (Design and Management of Manufacturing Systems) Conference**, presenting the results of a successful research project in collaboration with Scania, a Swedish truck manufacturer.
- In 2008 his paper was awarded honorable mention as one of the five finalists of the **Young Author Prize** at the 17th IFAC World Congress in Seoul, Korea, with the paper Colledani M. “Integrated Analysis of Quality and Production Logistics Performance in Asynchronous Manufacturing Lines”.
- In 2011 his paper was awarded honorable mention as one of the five finalists of the **Young Author Prize** at the 18th IFAC World Congress in Milan, Italy, with the paper Colledani M, “Joint Design of Quality and Production Control in Multi-Stage Asynchronous Manufacturing Systems”.
- In 2013 his paper was awarded honorable mention as one of the four finalists of the **Young Author Prize** at the 11th AITEM Conference in Italy.
- In 2013 he was invited speaker at the VALUETOOLS 2013 - 7th International Conference on Performance Evaluation Methodologies and Tools that was held in Turin on December 10-12, 2013. The talk was titled “Analytical methods to support the configuration and reconfiguration of manufacturing and assembly systems”.
- In 2013 he was invited participant to the Manufature 2013 Conference in Vilnius on October 6-8, 2013.
- In 2014 he was Invited speaker at the “Panel discussion: Maximising Impact & Successful Innovation Strategy” within the 2013 EU Factory of the Future Impact Workshop, March 2013.
- In 2014 he organized and chaired the Special Session on “Zero Defect Manufacturing” within the CIRP Design Conference 2014, that was held in Milan, Italy.
- In 2014 he was Invited Speaker at the Conference on Italian-Serbian Collaboration Platform In Advanced Manufacturing Technology – ISC 2014 held in Belgrad the 29<sup>th</sup> of April, with a speech titled “INTELLIGENT FACTORY - Current Stage, Perspectives and Italian Ongoing Initiatives”.
- In 2015 he was Invited Speaker at the CESMA meeting on “Parting out of Aeronautics Components” in Rome, representing the Italian Cluster on Intelligent Factory - CFI.
- In 2015, the paper “M. Colledani, F. Franchini, F. Micchetti, A. Ratti, A. Taurisano *A software platform for the multi-objective early-stage design of automotive assembly lines*, IFAC-PapersOnLine, Volume 48, Issue 3, 2015, Pages

2287-2292” has been awarded the **Best Application Paper Award winner** at the INCOM 2015, Information Control Problems in Manufacturing.

- In 2015 he received the Best Poster Award at the CAE Conference 2015 for the poster titled "A computer-aided methodology for the design of de-manufacturing processes for waste recycling".
- In 2016, he co-authored a keynote speech at the 3rd International Conference on Ramp-Up Management (CIRP sponsored) from June 22nd until 24th, 2016, in Aachen titled Tolio, T., Colledani, M., “Towards Zero Defect Manufacturing: Production Quality improvement during Manufacturing Systems Ramp-up”.
- In 2017, he was invited speaker at the Italian Cluster Intelligent Factory general assembly on “Technologies 4.0: an engine for the intelligent factory”.
- In 2017, he was invited speaker at the CRIT – Center for Technology and Innovation Transfer in Modena.
- In 2017, he was invited by the EC DG-REGIO as a panel member at the Smart Regions 2.0 event in Helsinki, Finland, presenting the main outcomes of the Vanguard Initiative "De-and Remanufacturing" pilot network aiming at supporting industrial uptake and exploitation of innovative solutions for circular economy with a cross-regional approach.
- In 2017 he was invited speaker at the DG ECFIN “Workshop on Synergies” and at the workshop “Synergies between Horizon 2020 and the European Structural and Investment Funds: downstream combination for Climate action, Environment, Resource efficiency and Raw Materials”, in Brussels.
- In 2017, he was invited speaker at the EFFRA – European Factories of the Future Research Association meeting on Zero-defect manufacturing cluster in Brussels.
- In 2018, he was Invited Speaker at the Digital Innovation Hub Conference in Warsaw, organized by EC DG CNECT.
- In 2019 he was Invited Speaker at the Seminar “Interregional Innovation Investments: Strengthening innovation opportunities for firms in the EU”, organized by the Czech Ministry of Regional Development in cooperation with the European Commission, Prague, March 11<sup>th</sup>, 2019.
- In 2019, he was the organizer of a session on the FiberEUUse project focused on the recovery and re-use of composite materials within the Ellen Mac Arthur Foundation CE100 in Catalunya, Spain.
- In 2020, he was invited speaker at the European Cluster Conference 2020 organized by the European Cluster Collaboration Platform ECCP,
- In 2021 he was keynote speaker at the “RIS3 Strategies for a competitive and sustainable ecosystem in the Alpine Region” workshop organized by the Lombardy Region.
- In November 2021, he was invited speaker at the Wind Europe Eolis 2021 workshop “End-of-Life Issues & Strategies Seminar”.
- In June 2022, he was keynote speaker at the Batteries Europe General Assembly in Brussels.
- In December 2022, he was invited speaker at the Wind Europe Eolis 2022 “End-of-Life Issues & Strategies Seminar”, presenting the DeremCo project in Brussels.
- In March 2023, he was invited speaker at the APRA Europe Symposium on Remanufacturing in Pamplona, giving a presentation titled “The Digital Product Passport and Implications for the Remanufacturing Industry”.
- In May 2023, he was invited speaker at the CLEPA Materials Regulations and Sustainability event 2023, giving a presentation titled “The Digital Product Passport and value-chain implications: focus on the Cirpass and DigiPrime projects”.
- In June 2023 Invitation he was invited as a panelist to the SME2B Business Forum organized by the European Entrepreneurs CEA-PME in Brussels.

### **Technology Transfer activities and participation to Start-ups and spin-offs**

Prof. Colledani is the co-founder of the start-up FiberEUUse-Tech, that supports the market diffusion and uptake of one of the most promising technologies for cross-sectorial recycling and re-use of Glass-Fiber Reinforced Plastics (GFRP), or composite materials, from wind energy and other GFRP intense EU sectors, elaborated and tested in the EU project FiberEUUse. In particular, FiberEUUse-Tech commercializes a cyber-physical system for the control of size-reduction processes in recycling, making the quality of the obtained output streams repeatable over time, based on a patented solution (see publications). The start-up has been constituted in July 2023 and has been selected as recipient of the Lombardy Region prize by Start-Cup Italia among the most sustainable start-ups of the Year. Moreover, FiberEUUse-Tech has been selected as recipient of the Switch-2-Product competition of Politecnico di Milano.

## Additional Information

He speaks fluent English and Spanish.

## Complete List of Publications

### Reviews

He is reviewer of the following scientific journals: IIE Transactions, International Journal of Production Economics, IEEE Transactions on Automation Science and Engineering, Annals of OR, SME Journal of Manufacturing Systems, International Journal of Production Research, International Journal of Computer Integrated Manufacturing, Stochastic Models, CIRP Journal of Manufacturing Science and Technology.

### Performance Indicators from the Scopus Database (July 31<sup>st</sup> 2023):

N° of citations: 2377.

Average N° of citations per year (from 2004 to 2023): 125.

N° of citations (excluding self-citations of all authors): 1899.

H index: 25

### Patents (1):

Colledani, M., Diani, M., Delfrate, D., Domanda di brevetto per invenzione industriale n. 102022000026121 depositata il 20/12/2022 dal titolo: "Apparato di frantumazione meccanica in continuo e relativo metodo di controllo" a nome Politecnico di Milano.

### Books Editing (1):

Colledani M., Turri S., "Circular Economy Solutions for Fiber Reinforced Composites", 2023, Springer Cham, Digital Innovations in Architecture, Engineering and Construction series, <https://doi.org/10.1007/978-3-031-22352-5>.

### Book Chapters (13):

Colledani M., Matta A., Tolio T., "Performance evaluation of production lines with finite buffer capacity producing two different products", in G. Liberopoulos, C.T. Papadopoulos, B. Tan, J. Macgregor Smith, S.B. Gershwin Editors, "Stochastic Modelling of Manufacturing Systems - Advanced in design, performance evaluation and control issues", Ed. Springer 2006, pp. 77-97. ISBN 3-540-26579-1

Colledani M., Tolio T. "Performance Evaluation of Production Systems Monitored by Statistical Process Control and Offline Inspections", Information Control Problems in Manufacturing 2006, Edited by Alexandre Dolgui, Gerard Morel and Carlos Pereira, Ed. Elsevier 2006, pp. 317-322. ISBN 0-08-044654-X.

M. Colledani, F. Iovane, T. Tolio, M. Urgo "Design of sustainable product life cycles" editors Jorg Niemann, Serge Tichkiewitch, Engelbert Westkamper, 2009, Springer-verlag, ISBN: 9783540790815.

Colledani M., Terkaj W, Tomasella M. and Tolio T. "Development of a Conceptual Framework to Manage Manufacturing Knowledge Related to Products, Processes and Production Systems, Knowledge Management Book, VRL KCiP, Springer ed. 2008, pp. 259-284, ISBN 978-3-540-78430-2.

Colledani M. Terkaj W and Tolio T. "Product-Process-System Information Formalization" in Design of Flexible Systems", in Tolio T. Editor "Design of Flexible Production Systems", Chapter 4, Ed. Springer, pp. 63-86. ISBN: 978-3-540-85413-5.

Colledani, M., Copani, G., Picone, N, Pepe, M., Tasora, A., "Highly Evolvable E-waste Recycling Technologies and Systems". In: Tolio T., Copani G., Terkaj W. (eds) Factories of the Future. Springer, Cham, Pag. 109-128.

Colledani, M., Copani, G., Brusafferri, A., Pievatolo, A., Amendola, E., Avella, M., Fabrizio, M., "Integrated Technological Solutions for Zero Waste Recycling of Printed Circuit Boards (PCBs)". In: Tolio T., Copani G., Terkaj W. (eds) Factories of the Future. Springer, Cham, Pag. 149-169.

Colledani, M, Angius, A., "Lead Time Analysis of Manufacturing Systems with Time-Driven Rework Operations", In Lecture Notes in Mechanical Engineering, 2021.

Colledani, M., Turri, S., Diani, M., Mathes, V., "Introduction, Context, and Motivations of a Circular Economy for Composite Materials" in Colledani M., Turri S., "Circular Economy Solutions for Fiber Reinforced Composites", 2023, Springer Cham, Digital Innovations in Architecture, Engineering and Construction series, pp. 1-16.

Colledani, M., Turri, S., Diani, M., Mathes, V., "The FiberEUse Demand-Driven, Cross-Sectorial, Circular Economy Approach", in Colledani M., Turri S., "Circular Economy Solutions for Fiber Reinforced Composites", 2023, Springer Cham, Digital Innovations in Architecture, Engineering and Construction series, pp. 17-36.

Colledani, M., Picone, N., Diani, M., Gentilini, L., Angius, A., Jensen, J.P. "Disassembly of Large Composite-Rich Installations" in Colledani M., Turri S., "Circular Economy Solutions for Fiber Reinforced Composites", 2023, Springer Cham, Digital Innovations in Architecture, Engineering and Construction series, pp. 37-60.

Colledani, M., Picone, N., Diani, M., "Smart Composite Mechanical Demanufacturing Processes", in Colledani M., Turri S., "Circular Economy Solutions for Fiber Reinforced Composites", 2023, Springer Cham, Digital Innovations in Architecture, Engineering and Construction series, pp. 61-80.

Colledani, M., Diani, M., Abdelrahman, A., de Melo Pereira C.,L., "Impact of Policy Actions on the Deployment of the Circular Value-Chain for Composites" in Colledani M., Turri S., "Circular Economy Solutions for Fiber Reinforced Composites", 2023, Springer Cham, Digital Innovations in Architecture, Engineering and Construction series, pp. 445-474.

### International Journals (47):

- Colledani M., Matta A., Tolio T., “*Performance evaluation of production lines with finite buffer capacity producing two different products*”, OR Spectrum (2005) 27: 243–263.
- Colledani M., Tolio T., “*A Decomposition Method to Support the Configuration / Reconfiguration of Production Systems*”, Annals of the CIRP Vol. 2005, 54(1), pp. 441-444.
- Colledani M., Grasso M. Matta A. Tolio T., “*A new Analytical Method for Buffer Space Allocation in Production Lines*”, CIRP Journal of Manufacturing Systems, Vol 34 , 2005, No 4.
- Colledani M., Tolio T., “*Impact of Quality Control on Production Systems Performance*”, Annals of the CIRP Vol. 2006, 55(1), pp. 453-456.
- Colledani M., Gandola F. Matta A., Tolio T. “*Performance Evaluation of Linear And Non Linear Multi-Product Multi-Stage Lines With Unreliable Machines and Finite Homogeneous Buffers*” IIE Transactions, Volume 40, Issue 6 June 2008 , pages 612 – 626.
- Colledani M., Tolio T. “*Performance Evaluation of Production Systems Monitored by Statistical Process Control and Offline Inspections*”, 2009, International Journal of Production Economics, Volume 120, Issue 2, August 2009, Pages 348-367.
- Colledani M., Ekvall M., Lundholm T., Moriggi P., Polato A., Tolio T. “*Analytical methods to support continuous improvements at Scania*” 2010, International Journal of Production Research, Vol. 48, No. 7, 1 April 2010, pages 1913–1945.
- Colledani M., Matta A., Tolio T. “*Analysis of Production Variability in Multi-stage Manufacturing Systems*”, CIRP Annals - Manufacturing Technology 2010, 59(1), pp. 449-452.
- Colledani M., Tolio T. “*Performance Evaluation of Transfer Lines with General Repair Times and Multiple Failure Modes*” 2011, Annals of Operations Research, Volume 182, Number 1, pages 31-65, DOI: 10.1007/s10479-009-0595-3.
- Colledani M. Tolio T. “*Integrated analysis of quality and production logistics performance in manufacturing lines*”, 2011, International Journal of Production Research, Volume 49, Number 2, January 2011, pp. 485-518.
- Colledani M., Tolio T. “*Joint design of quality and production control in manufacturing systems*”, 2011, CIRP Journal of Manufacturing Science and Technology, 4, 3, 281-289.
- Colledani, M., Gershwin S.B., “*A Decomposition Method for Approximate Evaluation of Continuous Flow Multi-Stage Lines with General Markovian Machines*”, Annals of Operations Research, 2013, Volume 209, Issue 1, pp 5-40.
- Colledani M., Tolio T., “*Integrated Quality, Production Logistics and Maintenance Analysis of Multi-Stage Asynchronous Manufacturing Systems with Degrading Machines*” CIRP Annals – Manufacturing Technology, 2012, 61(1), pp. 455-458.
- Colledani M. Wolf M.I., Gutowski T., Gershwin S.-B. “*A network flow model for the performance evaluation and design of material separation systems for recycling*”, IEEE Transactions on Automation Science and Engineering, 2013, 10-1, 65-75.
- Colledani M., Tolio T., “*Integrated Process and System Modelling for the Design of Material Recycling Systems*”, CIRP Annals - Manufacturing Technology, 2013, 62(1), pp. 447-452.
- Assaf R., Colledani M., Matta A., “*Analytical Evaluation of the Output Variability in Production Systems with General Markovian Structure*” OR Spectrum, 2014, Volume 36, Issue 3, pp 799-835.
- Angius A., Colledani M., Horvath A. “*Moments of accumulated reward and completion time in Markovian models with application to unreliable manufacturing systems*” Performance Evaluation, Volumes 75–76, May–June 2014, Pages 69–88.
- Colledani M., Ebrahimi D., Tolio T. “*Integrated quality and production logistics modelling for the design of selective and adaptive assembly systems*” CIRP Annals - Manufacturing Technology, 2014, 63(1), pp. 453-456.
- Colledani M., Fischer A., Jung B., Lanza G., Schmitt R., Tolio T., Vancza J., “*Design and management of manufacturing systems for production quality*” CIRP Annals - Manufacturing Technology, 2014, 63(2), pp. 773-796.
- Peters S., Lanza G., Ni J., Xiaoning J., Pei-Yun Y., Colledani M., *Automotive manufacturing technologies – an international viewpoint*, Manufacturing Review, 2014.
- Colledani M., Angius A., Horvath A. “*Production quality performance in manufacturing systems processing deteriorating products*” CIRP Annals - Manufacturing Technology, 2015, 64(1), pp. 431-434.
- Ceglarek D., Colledani, M., Vancza J., Kim D.-Y., Marine, C., Kogel-Hollacher, M., Mistry, A., Bolognese, L. “*Rapid deployment of remote laser welding processes in automotive assembly systems*”, CIRP Annals - Manufacturing Technology, 2015, 64(1), pp. 389-394.
- Borrotti, M., Colledani, M., Critelli, I., Degiorgi, A., Pievatolo, A., *A computer-aided methodology for the optimization of electrostatic separation processes in recycling*, Applied Stochastic Models in Business and Industry, Volume 32, Issue 1, pp. 133–148, 2016.
- Colledani, M., Battaya, O., *A Decision Support System to Manage the Quality of End-of-Life Products in Disassembly Systems*, CIRP Annals - Manufacturing Technology, 2016, 65(1), pp. 41-44.
- Colledani, M., Gyulai, D., Monostori, L., Urgo, M., Unglert, J., Van Houten, F., *Design and Management of Reconfigurable Assembly lines in the Automotive Industry*, CIRP Annals - Manufacturing Technology, 2016, 65(1), pp. 441–446.
- Candiani, G., Picone, N., Pompilio, L., Pepe, M., Colledani, M. *Characterization of fine metal particles derived from shredded WEEE using a hyperspectral image system: Preliminary results*, Sensors, 17(5):1117, 2017.



Colledani, M., Tolio, T., Dufflou, J., Seliger, G., Bernard, A., Kara, S., Battaia, O., Takata, S., *Design, Management and Control of Demanufacturing and Remanufacturing Systems*, CIRP Annals - Manufacturing Technology, 66(2), pp. 585-609, 2017.

Colledani, M., Manzini, M., Unglert, J., Gyulai, D., Jauregui-Becker, J.M., Monostori, L., Urgo, M., *An integrated framework for design, management and operation of reconfigurable assembly systems*, Omega, 2018, 78, pp. 69-84.

Colledani, M., Coupek, D., Verl, A., Aichele, J., Yemane, A., *A cyber-physical system for quality-oriented assembly of automotive electric motors*, CIRP Journal of Manufacturing Science and Technology, 20, pp. 12-22, 2018.

Colledani M., Angius, A., Horvath, A., *Lead-Time Oriented Production Control Policies in Two-Machine Production Lines*, IISE Transactions, 50:3, 178-190, 2018.

Gaspari, L., Colucci, L., Butzer, S., Colledani, M., Steinhilper, R., *Modularization in material flow simulation for managing production releases in remanufacturing*, Journal of Remanufacturing, 2017, 7(2-3), pp. 139-157.

Colledani, M., Nassehy, A., *A multi-method simulation approach for evaluating the effect of the interaction of customer behaviour and enterprise strategy on economic viability of remanufacturing*, CIRP Annals - Manufacturing Technology, Volume 67(1), 2018, pp. 33-36.

Colledani, M., Tolio, T., Yemane, A., *Production quality improvement during manufacturing systems ramp-up*, CIRP Journal of Manufacturing Science and Technology, 2018, 23, pp. 197-206.

Angius, A., Colledani, M., Yemane, A., *Impact of condition based maintenance policies on the service level of multi-stage manufacturing systems*, Control Engineering Practice, 2018, 76, pp. 65-78.

Colledani, M., Magnanini, M., Tolio, T., *Impact of opportunistic maintenance on manufacturing system performance*, CIRP Annals - Manufacturing Technology, 2018, 67(1), pp. 499-502.

Colledani, M., Diani M., Lanzarone, E., Pievatolo, A., *A comminution model with homogeneity and multiplication assumptions for the Waste Electrical and Electronic Equipment recycling industry*, Journal of Cleaner Production, Volume 211, 2019, pp. 665-678.

Rigoldi, A., Trogu, E.F., Marcheselli, G.C., Artizzu, F., Picone, N., Colledani, M., Deplano, P., Serpe, A., *Advances in Recovering Noble Metals from Waste Printed Circuit Boards (WPCBs)*, ACS Sustainable Chemistry and Engineering, Volume 7, Issue 1, 7 January 2019, pp. 1308-1317.

Colledani, M., Yemane, A., *Performance analysis of unreliable manufacturing systems with uncertain reliability parameters estimated from production data*, International Journal of Computer Integrated Manufacturing, vol. 32, 2019 - Issue 9, pp. 875-889.

Colledani, M., Angius, A., *Integrated production and reconfiguration planning in modular plug-and-produce production systems*, CIRP Annals - Manufacturing Technology, 2019, 68(1), pp. 435-438.

Colledani, M., Mossali, E., Picone, N., Gentilini, L., Rodriguez, O., Perez, J.-M., *Lithium-ion batteries towards circular economy: A literature review of opportunities and issues of recycling treatments*, Journal of Environmental Management, 264, 110500, 2020.

Colledani, M., Angius, A., *Production quality performance of manufacturing systems with in-line product traceability and rework*, CIRP Annals - Manufacturing Technology, 2020, 69(1), pp. 365-368.

Mantelli, A., Romani, A., Suriano, R., Diani, M., Colledani, M., Sarlin, E., Turri, S., Levi, M., *Uv-assisted 3d printing of polymer composites from thermally and mechanically recycled carbon fibers*, Polymers, 13(5), pp. 1-15, 726, 2021.

Colledani, M., Demir, O., *Dynamic implementation of function-oriented selective and adaptive assembly in small-lot production*, CIRP Annals - Manufacturing Technology, 2022, 71(1), pp. 393-396.

Nassehi, A., Colledani, M., Lutters, E., Kadar, B., *Daydreaming Factories*, CIRP Annals - Manufacturing Technology, 2022, 71(2), pp. 671-692.

Powell, D., Magnanini, M.C., Colledani, M., Mykelburst, O., *Advancing zero defect manufacturing: A state-of-the-art perspective and future research directions*, Computers in Industry, 2022, 136, 103596.

Colledani, M., Gentilini, L., Mossali, E., Picone, N., O., *A novel mechanical pre-treatment process-chain for the recycling of Li-Ion batteries*, CIRP Annals - Manufacturing Technology, 2023, 72(1), pp. 17-20.

Demir, O., Colledani, M., Paoletti, R., Pippione, G., *Function-based selective and adaptive cyber-physical assembly system for increased quality in optoelectronics industry*, Computers in Industry, 2023, 148, 103915.

#### **International Conferences (100):**

Colledani M., Matta A., and Tolio T., 2003, "Performance Evaluation of Production Lines with Finite Buffer Capacity Producing two Different Products", Fourth Aegean International Conference on Analysis of Manufacturing Systems, July 1-4 2003, Samos Island, Greece, pp 231-240.

Colledani M., Matta A., Tolio T., "Performance evaluation of continuous production lines with deterministic processing times, multiple failure modes and multiple part types" 4° CIRP International Seminar on Intelligent Computation in Manufacturing Engineering CIRP ICME '04. 30 June-2 July, Sorrento, Italy. pp. 29-34.

Colledani M, Grasso M. Matta A. Tolio T., "A new Analytical Method for Buffer Space Allocation in Production Lines", 37° CIRP International Seminar on Manufacturing Systems. May 19-21, Budapest, Hungary. pp. 231-237.

Colledani M., Matta A., Tolio T., "Performance evaluation of multi-product two-machines lines", 18th International Conference on Production Research, 2005.

- Colledani M., Tolio T., "Impact of statistical process control (SPC) on the performance production systems - Part One (small systems)", 5<sup>o</sup> International Conference on Analysis of Manufacturing Systems- Production Management. May 20-25, Zakynthos Island, Greece, 2005, pp. 76-84.
- Colledani M., Tolio T., "Impact of statistical process control (SPC) on the performance production systems - Part Two (large systems)", 5<sup>o</sup> International Conference on Analysis of Manufacturing Systems- Production Management. May 20-25, Zakynthos Island, Greece, 2005, pp. 85-92.
- Colledani M., Matta A., Tolio T., "Performance evaluation of flow lines with multiple products", 5<sup>o</sup> International Conference on Analysis of Manufacturing Systems- Production Management. May 20-25, Zakynthos Island, Greece, 2005, pp. 103-110.
- Colledani M., Tolio T. "Performance Evaluation of Production Systems Monitored by Statistical Process Control and Offline Inspections", Proceedings of the INCOM 12th IFAC Symposium on Information Control Problems in Manufacturing, Saint Etienne, France, May 2006, pp. 329-334. Received the Best Young Authors Paper Award.
- Colledani M., Tolio T. "An Analytical Method to Support the Design of Production Systems Monitored by Statistical Process Control" proceedings of the 39th CIRP Seminar on Manufacturing Systems, Ljubljana, Slovenia, 7-9 June 2006, pp 423-431.
- Borgh D., Colledani M., Simone F., Tolio T., "Integrated Analysis of Production Logistics and Quality Performance in Transfer Lines with Rework" Proceedings of Analysis of Manufacturing System Conference, Luntheren, The Netherlands, 11-16 May 2007, pp. 15-20.
- Colledani M. and Tolio T. "Performance Evaluation of Long Production Lines with General Repair Times and Multiple Failure Modes", Proceedings of Analysis of Manufacturing System Conference, Luntheren, The Netherlands, 11-16 May 2007, pp. 57-63.
- M. Colledani, T. Lundholm, P. Moriggi, A. Polato, T. Tolio "A Decomposition Method to Support Evaluation and Continuous Improvement of Reconfigurable Manufacturing System Performance" Proceedings of the 40<sup>o</sup> CIRP Conference on Manufacturing Systems, 30 May-1 June 2007, Liverpool, UK.
- Colledani M. "Integrated Analysis of Quality and Production Logistics Performance in Asynchronous Manufacturing Lines", 17<sup>th</sup> IFAC World Congress 2008, July 6-11 2008, Seoul, Korea. Awarded honorable mention - Young Author Prize.
- Colledani M., Matta A. Tolio T. "Analysis of the production variability in manufacturing lines with multiple failure modes machines" ASME ESDA Conference, July 7-9 2008, Haifa, Israel.
- Colledani M., Gershwin S.-B. "Modeling and Analysis of Two-Stage Systems with Parallel Machines and Limited Repair Capacity" 13th IFAC Symposium on Information Control Problems in Manufacturing, June 3 - 5, 2009, Moscow, Russia.
- Colledani M., Gershwin S.-B. "A Decomposition Method for Approximate Evaluation of Continuous Flow Multi-Stage Lines with General Markovian Machines", 7th Conference on Stochastic Models of Manufacturing And Service Operations, 7-12 June, 2009, Ostuni, Italy, pp. 73-80.
- Borgh D., Colledani M., Tolio T. "An analytical method for the optimal design of buffers in asynchronous transfer lines" 7th Conference on Stochastic Models of Manufacturing And Service Operations, 7-12 June, 2009, Ostuni, Italy, pp. 225-232.
- Colledani M., Simone F., Tolio T. "Performance evaluation of two machine lines with phase-type processing time and phase-type repair times" 7th Conference on Stochastic Models of Manufacturing And Service Operations, 7-12 June, 2009, Ostuni, Italy, pp. 89-96.
- Colledani M., Matta A., Moriggi P., Simone F. "Analysis of two-machine lines with operation-dependent and time-dependent failure modes, MITIP Conference, 15-16 October 2009, Bergamo - Italy.
- Assaf R., Colledani M., Matta A. "Analysis of the Output Variance in Production Lines: Methodology and Applications". MITIP Conference, 15-16 October 2009, Bergamo - Italy.
- M. Colledani, Wolf, M.I., S.B. Gershwin, and T.G. Gutowski, "Modeling and Design of Multi-Step Separation Systems," IEEE/International Symposium on Sustainable Systems and Technology, Washington D.C., May 16-19, 2010.
- Colledani, M., S.B. Gershwin, T. Gutowski and M.I. Wolf "A methodology to support the design of multi-stage material separation systems for recycling," 43rd CIRP International Conference on Manufacturing Systems, Vienna, Austria, May 2010, pp 651-658.
- Colledani, M., Tolio T., "A method for the Joint Design of Quality and Production Control in Manufacturing Systems," 43rd CIRP International Conference on Manufacturing Systems, Vienna, Austria, May 2010, pp. 335-342.
- Colledani, M. Teferi A., "Integrated Quality and Production Logistics Analysis of Closed Loop Manufacturing Systems", Proceedings of the EFTA 2010 Conference on Emerging Technology and Flexible Automation, Bilbao, Spain, September 13-16, 2010.
- Colledani M., Gershwin S.-B., "Issues in the Modelling and Design of Material Recycling Systems" 8th Conference on Stochastic Models of Manufacturing And Service Operations, 27 May - 1 June, 2011, Kusadasi, Turkey, pp 11-18.
- Colledani M., "Joint Design of Quality and Production Control in Multi-Stage Asynchronous Manufacturing Systems", Proceedings of the 18th IFAC World Congress, 2011, Milan, Italy, Aug 28 - Sep 2, 2011. ISBN: 978-3-902661-93-7. Awarded honourable mention - Young Author Prize.
- Angius A., Colledani M, Horvath, A., "Moments of Cumulated Output and Completion Time of Unreliable General Markovian Machines", Proceedings of the 18th IFAC World Congress, 2011, Milan, Italy, Aug 28 - Sep 2, 2011, ISBN: 978-3-902661-93-7.
- Colledani M., Ebrahimi D. "Optimal Process Shift Design in Selective and Adaptive Production Systems" in Proceedings of the 45<sup>th</sup> CIRP CMS 2012, May 16-18 2012, Athens, Greece.
- Assaf R., Colledani M., "A Decomposition Approach for the Approximate Evaluation of the Output Variability in Multi-Stage Production Lines" in Proceedings of the 12th INCOM Information Control Problems in Manufacturing, May 23-25 2012, Bucarest, Romania.

- F. Braghin, M. Colledani, S. Negrini, A. Tasora, "A multi-body, multi-particle simulation model of Eddy Current Separation (ECS) process for recycling" in SUM2012 Symposium on Urban Mining, May 21-23 2012, Bergamo, Italy.
- Colledani M, Teferi A., "Performance Analysis of Unreliable Manufacturing Systems with Uncertain Parameter Estimates" in proceedings of CIRP ICME 2012, 8<sup>th</sup> CIRP Conference on Intelligent Computation in Manufacturing Engineering, Innovative and Cognitive Production Technology and Systems, 18 - 20 July 2012, Ischia (Naples), Italy.
- Colledani M., Jadidi A., Wolf M. "Robust Design Of Material Separation Systems For Recycling" , The 10th Global Conference on Sustainable Manufacturing Towards Implementing Sustainable Manufacturing" October 31st – November 2nd, 2012, İstanbul, Turkey ISBN-978-605-63463-1-6.
- Brusaferrri A., Colledani M, Copani G. Pedrocchi N., Sacco M. Tolio T., "Integrated De- Manufacturing Systems as New Approach To End-Of-Life Management Of Mechatronic Devices", The 10th Global Conference on Sustainable Manufacturing Towards Implementing Sustainable Manufacturing" October 31st – November 2nd, 2012, İstanbul, Turkey ISBN-978-605-63463-1-6.
- Colledani M., Lundholm T., Ratti A., Tolio T. "Analytical methods for performance evaluation of transfer lines with shared repair capacity at Scania" VTI 2012, Changchun, China.
- Colledani M., Teferi A. "Impact of Machine Reliability Data Uncertainty on the Design and Operation of Manufacturing Systems" Proceedings of the 44th CIRP CMS Conference on Manufacturing Systems, May 29-31, Sesimbra, Portugal, Procedia CIRP 7 (2013) 557-562.
- Colledani M., Pedrielli G., Terkaj W. Urgo M. "Integrated Virtual Platform for Manufacturing Systems Design" Proceedings of the 44th CIRP CMS Conference on Manufacturing Systems, May 29-31, Sesimbra, Portugal, Procedia CIRP 7 (2013) 425-430.
- Colledani M. "A Decomposition Method for the Analysis of Long Buffered Production Systems with Discrete General Markovian Machines" Proceedings of the 7th IFAC Conference on Manufacturing Modelling, Management, and Control International Federation of Automatic Control June 19-21, 2013. Saint Petersburg, Russia, pp. 1644-1649.
- Colledani M. "Performance Evaluation of Two-stage Buffered Production Systems with Discrete General Markovian Machines", Proceedings of the 7th IFAC Conference on Manufacturing Modelling, Management, and Control International Federation of Automatic Control June 19-21, 2013. Saint Petersburg, Russia, pp. 1638-1643.
- Colledani M. Ebrahimi D. "Performance Evaluation of Selective and Adaptive Assembly Systems" in Proceedings of the Ninth International Conference on Stochastic Models of Manufacturing and Service Operations, SMMSO 2013, May 25-30 2013, Seon, Germany, pp. 17-26.
- Colledani M., Coupek D., Aichele J. "Proactive Quality Control System for Defect Reduction in the Production of Electric Drives", 3rd International Electric Drives Production Conference and Exhibition 2013 October 29th - 30th, 2013 Nuremberg, Germany.
- Angius A., Colledani M. "Transient Analysis of Asynchronous Markovian Production Lines by Quasi Product Form" in Proceedings of VALUETOOLS 2013 - 7th International Conference on Performance Evaluation Methodologies and Tools, December 10-12, 2013, Turin, Italy.
- Colledani, M., Coupek, D., Verl, A., Aichele, J., Yemane, A., Design and evaluation of in-line product repair strategies for defect reduction in the production of electric drives, in Proceedings of the 24th CIRP Design Conference, 2014, Milano, Italy.
- Colledani M., Copani G., Tolio T. "De-manufacturing Systems" Keynote paper at the 47<sup>th</sup> CIRP Conference on Manufacturing Systems, 28-30 April 2014, Windsor, Ontario, Canada.
- Colledani M. Critelli I, De Giorgi A. Tasora A. "A simulation model of Corona Electrostatic Separation (CES) for the recycling of Printed Circuit Boards (PCBs)" Symposium on Urban Mining SUM 2014, May 19-21, Bergamo, Italy.
- Colledani M., Ratti A., Senanayake C. "An Approximate Analytical Method to Evaluate the Performance of Multi-Product Assembly Manufacturing Systems". 9th CIRP Conference on Intelligent Computation in Manufacturing Engineering - CIRP ICME '14, 16-18 July 2014, Gulf of Naples, Italy.
- Colledani M., Bolognese L, Ceglarek D., Franchini F., Marine C., Mistry A. Multi-objective early-stage design of automotive hybrid assembly lines" CIRPe2014 – 3rd CIRP Global Web Conference on Production Engineering Research.
- Picone N., Candiani G., Colledani M., Pepe M. "HyperSpectral Imaging for the in-line characterization of fine mixtures in WEEE mechanical recycling systems." Care Electronics November 17 - 20, 2014.
- Colledani M, Critelli I, De Giorgi A, Tasora A. "Multi-Body Granular Flow Simulation For The Design and Operation Of Mechanical Separation Processes For Recycling", Care Electronics November 17 - 20, 2014.
- Colledani M, Critelli I., De Giorgi A, Tasora A. "Particle simulation of granular flows in electrostatic separation processes", SIMUL 2014, The Sixth International Conference on Advances in System Simulation, October 12 - 16, 2014 - Nice, France.
- Colledani M, Critelli I., De Giorgi A, Tasora A. "A multi-body simulation model for Corona Electrostatic Separator machine", The Ninth International Conference on Engineering Computational Technology", Naples, Italy, 2-5 September 2014.
- M. Colledani, A. Yemane, D. Coupek, A. Lechler "Quality-oriented design of rotor assembly strategies for electric drive production systems" Cirp Design Conference 2015, Haifa, Israel.
- M. Colledani, A. Angius, A. Horvath, Lead-time oriented production control policies in two-machine production lines, IFAC-PapersOnLine, Volume 48, Issue 3, 2015, Pages 2399-2404.
- M. Colledani, F. Franchini, F. Micchetti, A. Ratti, A. Taurisano A software platform for the multi-objective early-stage design of automotive assembly lines, IFAC-PapersOnLine, Volume 48, Issue 3, 2015, Pages 2287-2292. Best Application Paper Award winner.

- G. Candiani, N. Picone, L. Pompilio, M. Pepe, M. Colledani “*Characterization of fine metal particles using hyperspectral imaging in automatic waste recycling systems*”, WHISPERS conference 2015, Tokio, Japan.
- Tasora, A. Critelli, I. Colledani, M. Mazhar, H. “*Parallel Simulation of Multidisperse granular flows using the GPU*”, Proceedings of the Fourth International Conference on Parallel Distributed, Grid and Cloud Computing for Engineering, Civil-Comp Press, Stirlingshire, Uk, 2015, doi: 10.4203/ccp.107.43.
- Colledani M., Gershwin S.-B., Angius A., Horvath A., “*Lead Time Dependent Product Deterioration in Manufacturing Systems with Serial, Assembly and Closed-loop Layout*”, 10th Conference on Stochastic Models of Manufacturing And Service Operations, 1-6 June, 2015, Volos, Greece.
- M. Colledani, A. Angius, A. Horvath, S.B. Gershwin “*Analysis of the Lead Time Distribution in Closed Loop Manufacturing Systems*”, 8th IFAC Conference on Manufacturing Modelling, Management and Control. June 28-30, 2016, University of Technology of Troyes, France
- A. Angius, M. Colledani, M. Manzini, A. Ratti, M. Urgo “*Equipment selection and evaluation approach for an adaptable assembly line*”, 8th IFAC Conference on Manufacturing Modelling, Management and Control. June 28-30, 2016, University of Technology of Troyes, France
- M. Colledani, L. Silipo, A. Yemane, G. Lanza, N. Stricker, F. Ziprani, G. Fogliazza “*Technology based industrial product-services supporting robustness in manufacturing systems*”, 8th IFAC Conference on Manufacturing Modelling, Management and Control. June 28-30, 2016, University of Technology of Troyes, France
- M. Colledani, A. Yemane, L. Silipo, A. Angius “*Impact of Preventive Maintenance on the Service Level of Multi-stage Manufacturing Systems with Degrading Machines*”, 8th IFAC Conference on Manufacturing Modelling, Management and Control. June 28-30, 2016, University of Technology of Troyes, France.
- J. M. Jauregui Becker, B. Kadar, M. Colledani, N. Stricker, M. Urgo, J. Unglert, D. Gyulai, E. Moser “*The RobustPlaNet Project: Towards Shock-Robust Design Of Plants And Their Supply Chain Networks*” 8th IFAC Conference on Manufacturing Modelling, Management and Control. June 28-30, 2016, University of Technology of Troyes, France
- Colledani M., Silipo L., Yemane A., Lanza G., Bürgin J., Hochdörffer J., Georgoulas K., Mourtzis D., Bitte F., “*Technology-based product-services for supporting frugal innovation*”, 8<sup>th</sup> CIRP IPSS Conference on Product-Service Systems across Life Cycle, 20-21 June 2016, Bergamo (Italy).
- Colledani, M., Yemane, A., Tognetti, A., “*Analysis of In-line Quality-Oriented Assembly Strategies in the Production of Electric Drives*”, 26<sup>th</sup> CIRP Design Conference 2016, Procedia CIRP, Volume 50, 2016, Pages 784–789.
- N. Picone, G. Candiani, M. Colledani, M. Pepe “*Fine mixture characterization by hyperspectral imaging (HSI) in WEEE demanufacturing plants*”, in SUM2016 Symposium on Urban Mining, May 23-25, 2016, Bergamo, Italy.
- Colledani M., Baiguera, F., “*A knowledge-based method for the prediction of valuable materials in waste printed circuit boards*”, in SUM2016 Symposium on Urban Mining, May 23-25, 2016, Bergamo, Italy.
- Picone, N., Colledani, M., Copani, G., Diani, M., Tolio, T., 2016, “*Towards Smart E-waste demanufacturing systems exploiting Cyber-Physical Systems (CPSs) capabilities*”, Electronic Goes Green Conference, EGG, 7-9 September 2016, Berlin.
- Belkadi F., Buergin J., Kumar Gupta R., Zhang Y., Bernard A., Lanza G., Colledani M., Urgo M. “*Co-Definition of Product Structure and Production Network for Frugal Innovation Perspectives: Towards a Modular-based Approach*”, 26<sup>th</sup> CIRP Design Conference 2016, Procedia CIRP, Volume 50, 2016, Pages 589–594.
- Lafleur M., Terkaj W., Belkadi F., Urgo M., Bernard A., Colledani M., “*An Onto-based interoperability framework for the connection of PLM and production capability tools*”, 13th IFIP International Conference on Product Lifecycle Management. Columbia, USA, July 11-13, 2016.
- Colledani, M., Falconi, V., Sundin, E., Copani, G., *Key success factors for implementing Upgrading Remanufacturing*, 3<sup>rd</sup> International Conference on Remanufacturing, Linköping, 24-26 October 2017.
- A. Rigoldi, E. F. Trogu, G. C. Marcheselli, N. Picone, P. Deplano, M. Colledani, And A. Serpe “*Noble-Metals Recovery From Printed Circuit Boards: A Multidisciplinary Approach Towards Sustainability*” Proceedings Sardinia 2017 / Sixteenth International Waste Management and Landfill Symposium/ 2 - 6 October 2017 S. Margherita di Pula, Cagliari, Italy.
- Colledani, M., Eger, F., Coupek, D., Caputo, D., Penalva, M., Ortiz, J.-A., Freiberger, H., Kollegger, G., “*Zero defect manufacturing strategies for reduction of scrap and inspection effort in multi-stage production systems*”, 11th CIRP Conference on Intelligent Computation in Manufacturing Engineering - CIRP ICME '17.
- Colledani, M., Gershwin, S.-B., “*Dynamic Lead Time Based Control Point Policy for Multi Stage Manufacturing Systems*”, 11th Conference on Stochastic Models of Manufacturing and Service Operations, SMMSO 2017, Lecce, Italy.
- Picone N., Baiguera F., Colledani M., “*Towards smart e-waste demanufacturing systems exploiting multisensor vision system capabilities*”. Sensor Based Sorting Control, 8th International Conference, 6-7th March 2018, Aachen.
- Colledani M., Shabanpour N., *Integrated Workstation Design and Buffer Allocation in Disassembly Systems for Remanufacturing*, Procedia CIRP 69, pp. 921-926, 2018.
- Colledani M., Angius A., *Analysis of the Lead Time Distribution in Multi-Product Systems with Dedicated Buffers*, INCOM 2018, Information Control Problems in Manufacturing, Bergamo, Italy, May 2018.
- Colledani M., Lugaesi G., Frigerio N., Borzi G., Yemane A., Bassi A., Calegari D., *A Decision Support Methodology for the Design of Reconfigurable Assembly Systems*, INCOM 2018, Information Control Problems in Manufacturing, Bergamo, Italy, May 2018.
- Eger, F., Reiff, C., Brantl, B., Colledani, M., Verl, A., *Correlation analysis methods in multi-stage production systems for reaching zero-defect*

manufacturing, 51st CIRP Conference on Manufacturing Systems, CIRP CMS 2018.

Colledani, M., Yemane, A., Lugaresi, G., Borzi, G., Callegaro, D., *A software platform for supporting the design and reconfiguration of versatile assembly systems*, 51st CIRP Conference on Manufacturing Systems, CIRP CMS 2018.

Belkadi, F., Colledani, M., Urgo, M., Bernard, A., Colombo, G., Borzi, G., Ascheri, A., *Modular Design of Production Systems Tailored to Regional Market Requirements: A Frugal Innovation Perspective*, INCOM 2018, Information Control Problems in Manufacturing, Bergamo, Italy, May 2018.

Colledani, M., Picone, N., Ciccullo, A., *Hyperspectral Imaging for the On-line Identification and Classification of End-of-Life Lamps*, Proceedings of Electronics Goes Green - CARE INNOVATION 2018, Vien, Austria.

Reiff, C., Eger, F., Tempel, P., Magnanini, M. C., Ander Ortiz, J., Colledani, M., Verl, A., Sarries, I., *Smart Centering for Rotation-Symmetric Parts in Multi-Stage Production Systems for Zero-Defect Manufacturing*, 12th CIRP Conference on Intelligent Computation in Manufacturing Engineering - CIRP ICME 2018.

Eger, F., Reiff, C., Colledani, M., Verl, A., *Knowledge Capturing Platform in Multi-Stage Production Systems for Zero-Defect Manufacturing*, Proceedings of the 2018 25th International Conference on Mechatronics and Machine Vision in Practice.

Eger, F., Tempel, P., Magnanini, M. C., Reiff, C., Colledani, M., Verl, A., *Part Variation Modeling in Multi-Stage Production Systems for Zero-Defect Manufacturing*, Proceedings of 2019 IEEE International Conference on Industrial Technology (ICIT).

Dassisti, M., Chiarello, F., Fantoni, G., Priarone, P. C., Ingarao, G., Campana, G., Matta, A., Cimatti, B., Colledani, M., *Benchmarking the sustainable manufacturing paradigm via automatic analysis and clustering of scientific literature: A perspective from Italian technologists*, Proceedings of the 16th Global Conference on Sustainable Manufacturing, GCSM.

Gentilini, L., Mossali, E., Angius, A., Colledani, M., *A Safety Oriented Decision Support Tool for the Remanufacturing and Recycling of Post-use H&EVs Lithium-Ion Batteries*, 27th CIRP Life Cycle Engineering Conference 2020, Grenoble, France, Procedia CIRP, 90, pp. 73–78.

Diani, M., Colledani, N., *Energy consumption assessment and modeling of a comminution process: the glass fibers reinforced composites case-study*, 27th CIRP Life Cycle Engineering Conference 2020, Grenoble, France, Procedia CIRP, 90, pp. 483–487.

Gentilini, L., Mossali, E., Merati, G., Colledani, M., *Methodology and Application of Electric Vehicles Battery Packs Redesign for Circular Economy*, 30<sup>th</sup> CIRP Design Conference, 5-8 May 2020, South Africa, Procedia CIRP, 91, pp. 747–751.

Diani, M., Colledani, M., *Cyber-Physical Systems formalization in de- and remanufacturing and application to size reduction stage*, 30<sup>th</sup> CIRP Design Conference, 5-8 May 2020, South Africa, Procedia CIRP, 91, pp. 741–746.

Colledani, M., Magnanini, M.-C., Caputo, D., *Reference architecture for the industrial implementation of Zero-Defect Manufacturing strategies*, CIRP Manufacturing Systems Conference 2020, Procedia CIRP, 93, pp. 646–651.

Soldatos, J., Kefalakis, N., Despotopoulou, A.-M., Arabsofgar, D., Colledani, M.A., *Digital platform for cross-sector collaborative value networks in the circular economy*, Procedia Manufacturing, 2020, 54, pp. 64–69.

Peiró, L.T., Baiguera, F., Maci, A., Colledani, M., Durany, X.G.I., *Digitalization as an enabler of the Circular Economy of electronics*, Procedia Manufacturing, 2020, 54, pp. 58–63.

Colledani, M., Pedone, G., Beregi, R., Kis, K.B. *Enabling cross-sectorial, circular economy transition in SME via digital platform integrated operational services*, Procedia Manufacturing 54, pp. 70-75, 2020.

Colledani, M., Gentilini, L., Polidori, C., Fervorari, M. *Automated identification of circular value chains and synergies*, Procedia Manufacturing 54, pp. 76-8, 2020.

Magnanini, M.C., Melnychuk, O., Yemane, A., Borzi, G., Colledani, M., *A digital twin-based approach for multi-objective optimization of short-term production planning*, IFAC-PapersOnLine, 2021, 54(1), pp. 140–145.

Magnanini, M.C., Colledani, M., Melnychuk, O., Caputo, D., *Effect of work-force availability on manufacturing systems operations of job shops*, Procedia CIRP, 2021, 103, pp. 152–157.

Bodin, U., Dhanrajani, S., Abdalla, A.H., Palm, E., Schelén, O. *Demand-supply matching through auctioning for the circular economy*, Procedia Manufacturing 54, pp. 82-87.

Peiró, L.T., Baiguera, F., Crespo, M.S., Colledani, M., Durany, X.G. *Advancing in the analysis of materials in electr(on)ic equipment*, Procedia CIRP, 2022, 105, pp. 261–266.

Abdalla, A., Colledani, M., Pippione, G., Paoletti, R., *Design of Defect-based Value Retention Strategies in Optoelectronic Products – Industrial Case Study on Multi-Emitter Laser Diodes*, Procedia CIRP Open Access Volume 119, 2023, Pages 1146-1151,

Eger, F., Oechsle, S., Reiff, C., Magnanini, M.-C., Tempel, F., Lechler, A., Verl, A., Colledani, M., *Part Variation Modeling to Avoid Scrap Parts in Multi-stage Production Systems*, Procedia CIRP Open Access Volume 107, Pages 851 – 856, 2022, 55th CIRP Conference on Manufacturing Systems, CIRP CMS 2022.

Fervorari, M., Colledani, M., Talens Peiro, L., Sanclemente Crespo, M., Gabarrell i Durany, X., Alarte, F., Alvarez, B., *Envisioning the potential reuse and repair of electric vehicle batteries*, CARE Electronics 2023, Vienna.

Demir, O., Colledani, M., Teicher, U., Seidel, A., Achour, A., Hanel, A., Yemane, A., Borzi, G., Uhlenkamp, J.F., Eberlein, S., Poelarends, R., *Vertically Integrated Digital Twins for Rapid Adaptation of Manufacturing Value Chains*, Proceedings - European Council for Modelling and Simulation, ECMS International Conference on Modelling and Simulation, Volume 2023-June, Pages 435 – 441, 2023.

**National Conferences (9):**

Colledani M., Tolio T., “*An analytical method for optimal buffer capacity allocation in production systems*”, Proceedings of the 7th A.I.Te.M. Conference, Lecce, Sept 7th-9th, 2005.

Colledani M., Tolio T., “*Quality and Logistics Performance Measures of Production Systems Monitored by SPC and shared Off-line Inspections*”, Proceedings of the 8th A.I.Te.M. Conference, Montecatini Terme, Sept 10th-12th, 2007.

Colledani M. “*Integrated Quality and Production Logistics Analysis of Asynchronous Manufacturing Lines With Deteriorating Machines Monitored by SPC*”, Proceedings of the 10th A.I.Te.M. Congress, 2011.

Colledani M. “*Integrated Quality and Production Logistics Analysis of Selective Assembly Systems*”, Proceedings of the 11th A.I.Te.M. Congress, 2013.

Colledani M, Critelli I, Degiorgi A, Tasora A “*Granular Flow Simulation for the Design and Operation of De-manufacturing Processes and Systems*”, Proceedings of the 12th A.I.Te.M. Congress, 2015.

Colledani M., Copani G., Tolio T., “*Integrated Technological Solutions for Zero Waste Recycling of Printed Circuit Boards (PCBs)*”, Proceedings of the 12th A.I.Te.M. Congress, 2015.

Colledani, M., Yemane, A., Tolio, T., Urgo, M., “*ReCaM: Rapid Reconfiguration of Flexible Production Systems through Capability-based Adaptation, Auto-configuration and Integrated tools for Production Planning*”, Proceedings of the 13th A.I.Te.M. Congress, 2017.

Colledani, M., Diani, M., “*Cyber-Physical System for the Control of Size-reduction Processes in Demanufacturing to Unlock Demand-driven circular Value-Chains*”, Proceedings of the 15th A.I.Te.M. Congress, 2021.

Colledani, M., Diani, M., Torvi, S., “*Application of High Voltage Fragmentation to Treat End-of-Life Blades*”, Proceedings of the 16th A.I.Te.M. Congress, 2023.

Milan, 31-7-2023

Marcello Colledani