



Name: Flavio Tonelli

Position: Full Professor of Industrial Plants

Institution: University of Genoa

Email: flavio.tonelli@unige.it

LinkedIn: [Flavio Tonelli] (<https://www.linkedin.com/in/flavio-tonelli-95b44b1/>)

In brief - Flavio Tonelli is a Full Professor and researcher specializing in Industrial Intelligence, particularly within the emerging domain of Sovereign Industrial Intelligence. This interdisciplinary research field combines technological, operational, strategic, and geopolitical expertise to strengthen autonomy, security, and resilience within Italian and European industrial systems. Through the "Cognitive Sovereignty for the Industry of the Future" initiative (2025-2035), Tonelli seeks to further consolidate his role as a key figure in shaping sustainable, secure, and technologically autonomous industrial systems in Italy and Europe. His approach blends decades of industrial expertise with future-oriented research and international collaboration, ensuring strategic national and European leadership.

Strategic Research and Professional Journey

Tonelli's career, spanning over 25 years, demonstrates a clear and strategic trajectory with a strong emphasis on:

- Operations Strategy and Management
- Supply Chain Management
- Digital Manufacturing and Industry 4.0
- Industrial Sustainability (environmental, social, economic)
- Artificial Intelligence for complex industrial systems
- Modeling, simulation, and knowledge-based systems

He has consistently advocated integrating advanced digital technologies with industrial operations, demonstrated notably through initiatives such as the "Contemporary Factory" project in collaboration with Brunello Cucinelli, MIT, Bocconi, and IIT, where he emphasized human-centered sustainable production.

Strategic Research Initiative: Sovereign Industrial Intelligence (2025-2035)

Tonelli's current strategic research initiative, "Cognitive Sovereignty for the Industry of the Future," aims to position Italy as a proactive and resilient leader by integrating technological, operational, and geopolitical competencies. This includes addressing critical issues such as:

- Dual Use Management (EU Regulation 821/2021)

- Cybersecurity and Cyber Resilience
- Security and Integrity in Research
- Cognitive Psychology (System0) for enhanced human-AI interactions
- Innovative Materials and Manufacturing
- Development of Small Modular Reactors (SMRs)
- Protection and governance of Strategic Infrastructures

His comprehensive approach ensures responsible technological governance and sustainable industrial practices.

Key Leadership Roles

Tonelli's influential roles include:

- 2018-2023: President and member of the Scientific Technical Committee of the Digital Innovation Hub Liguria
- 2019-2022: Strategic Advisor of the national competence center on strategic infrastructures START 4.0 (MISE)
- 2021-2024: Unige representative within ANVUR Nucleo di Valutazione
- 2019 – now: Expert Enabled in the Innovation Manager 4.0 Italian register
- 2020 – now: Board of Directors of the National Intelligent Factory Technology Cluster (MIUR)

Education

1998: Master's Degree in Electronic and System Engineering, University of Genoa

1998: Qualification to practice as an engineer

2001: PhD in Production Systems and Industrial Plants, University of Parma

Academic Positions

2000 - 2010: Researcher in Industrial Plant Management (ING-IND-17), University of Genoa

2011 - 2020: Associate Professor of Industrial Mechanical Plants, University of Genoa

2020 - Present: Full Professor in Industrial Mechanical Plants, University of Genoa

Research Interests:

- Industrial Intelligence
- Artificial Intelligence
- Operations management
- Industry 4.0 and Cyber Physical Systems
- AI for Logistics and Supply Chain Management
- Industrial sustainability
- Industrial systems engineering
- Production systems and industrial plants

Publications and Citations:

- Over 160 published scientific papers
- SCOPUS citations: 2300+
- H-Index (SCOPUS): 24
- Scholar citations: 3900+
- H-Index (Scholar): 29

Teaching Activity:

- Courses Taught: Design and Management of Production Systems, Engineering for Industrial Sustainability, Production Quality & Sustainability, Industrial Logistics
- Total Average CFU/Year: 20
- Annual Exams: Approximately 300 exams/year

History and evolution

Flavio Tonelli has had a distinguished career at the University of Genoa, starting from his initial position as a researcher in 2000, progressing to an associate professor, and finally achieving the rank of full professor in 2020. His work spans across various domains of industrial engineering, with a significant focus on sustainability, operations management, and the advancements brought about by Industry 4.0. Tonelli has been an active participant and leader in numerous scientific and technical committees, contributing to the development of industrial standards and practices both nationally and internationally. His extensive publication record and high citation indexes underscore his impactful contributions to the field of industrial systems engineering[1][2][4][5].

Flavio Tonelli has actively contributed to the divulgation of remanufacturing and demanufacturing through various channels, emphasizing their importance in achieving industrial sustainability and supporting the transition towards a circular economy.

His past and current efforts include:

1. **Academic Publications:** Tonelli has authored and co-authored research papers that explore the design, management, and control of demanufacturing and remanufacturing systems. One notable publication available on ResearchGate discusses these systems in detail, highlighting their role in reducing greenhouse gas emissions and promoting sustainability within the manufacturing sector [4].
2. **Public Discourse and Advocacy:** In an article featured on Innovation Post, Tonelli discusses the necessity of an ecolabel for instrumental goods, touching upon the concepts of demanufacturing and remanufacturing as essential processes for component refunctionalization and end-of-life management. He emphasizes the role of these processes in preventing the industrial sustainability transition from becoming merely a superficial change. This discussion aligns with the Sustainable Development Goals of the 2030 Agenda, underscoring the cultural shift required within companies to embrace sustainability fully [2].
3. **Professional Roles and Contributions:** As a Full Professor at the University of Genoa and through his involvement with various committees and advisory roles, Tonelli integrates his research on demanufacturing and remanufacturing into broader discussions on digital manufacturing and industrial sustainability. His work with the National Intelligent Factory Technology Cluster, the START 4.0 competence center, and the Digital Innovation Hub Liguria, among others, positions him as a key figure in promoting sustainable industrial practices that include demanufacturing and remanufacturing as core components [3].