

Towards big data mining in Industry 4.0: quality modeling and monitoring in additive manufacturing

Fostered by Industry 4.0, complex and massive data sets are currently available in many industrial settings and manufacturing is facing a new renaissance, due to the widespread of emerging process technologies (e.g., additive manufacturing, micro-manufacturing) combined to a paradigm shift in sensing and computing. On the one hand, the product quality is characterized by **free-form complex shapes**, measured via non-contact sensors and resulting in large unstructured 3D point clouds. On the other hand, in-situ and in-line data are available as multi-stream **signals, image and video-images**. In this scenario, traditional approaches for intelligent data analysis need to be revised.

Starting from real industrial settings, opportunities and challenges to be faced in the current framework are discussed.



Biosketch

Bianca Maria Colosimo is professor in the Department of Mechanical Engineering of Politecnico di Milano, where she is Deputy-Head of the Department and co-founder of the *AddMe Lab*, a research laboratory on novel solutions for metal additive manufacturing. She is also member of *Polimi2040*, a team designated by the Rector with the aim of envisioning future scenarios for technical universities worldwide.

Politecnico di Milano is a technical university ranked 1st in Italy, 5th Europe and 9th worldwide in the area of Mechanical, Aeronautical & Manufacturing Eng. (QS international Ranking - 2020).

Since 2018, she is Editor-in-chief of the *Journal of Quality Technology* (Taylor and Francis, ASQ).

She is member of the QSR Advisory Board at INFORMS, Council member of ENBIS, member of the Implementation Support Group of the platform *Manufuture* of the European Commission (<http://www.manufuture.org>); member of the Board of Directors of *EIT manufacturing* – CLC south and of the Board of Directors of MADE (www.made-cc.eu); member of the Steering Committee of the World Manufacturing Forum (WMF) (<https://www.worldmanufacturingforum.org/>) and of the Steering Committee of the EU Vanguard initiative on 3D printing.

She received her MSc and PhD in Industrial Engineering from Politecnico di Milano. After her PhD, she was visiting scholar at the Pennsylvania State University (PSU).

Her research interest is mainly in the area of industrial data modeling, monitoring and control, with special attention to big data challenges in advanced manufacturing. On these topics, she is author of 100+ peer-reviewed contributions, most of them published in peer-reviewed international journals and books.

She is included among the top 100 Italian woman scientists in STEM – (<https://100esperte.it/>)