

PERSONAL INFORMATION

Mauro Tortonesi



Enterprise	University	EPR
<input type="checkbox"/> Management Level	<input type="checkbox"/> Full professor	<input type="checkbox"/> Research Director and 1st level Technologist / First Researcher and 2nd level Technologist
<input type="checkbox"/> Mid-Management Level	<input checked="" type="checkbox"/> Associate Professor	<input type="checkbox"/> Level III Researcher and Technologist
<input type="checkbox"/> Employee / worker level	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

WORK EXPERIENCE

9/2019-present

**Associate Professor**

Department of Mathematics and Computer Science, University of Ferrara, Italy

- Scientific coordinator of project "BD4M: Big Data 4 Manufacturing", value 500 k€, funded by the first national call for research and innovation grants of the BI-REX Industry 4.0 competence center (cofinanced by the Italian Ministry for Economic Development). The project has the **objective of developing a Big Data platform of large applicability in Industry 4.0 applications**. Participating companies: IMA, Bonfiglioli Riduttori, SACMI, Poggipollini, MEP, Philip Morris International, BitBang, CDM / Lutech (PTC group), DataRiver.
- Research unit coordinator for the "Dynamic Edge computing for Plant MONitoring (DEEPMON)", value 500 k €, funded by the first national call for research and innovation grants of the BI-REX Industry 4.0 competence center (cofinanced by the Italian Ministry for Economic Development). The project has the **objective of developing innovative adaptive and context-aware Big Data solutions at the edge for Industry 4.0**. Participating companies: IMA, Bonfiglioli Riduttori, SACMI, Poggipollini, EMAG, Philip Morris International, CDM / Lutech (PTC group), DataRiver, Siemens.
- Research unit scientific coordinator for the SBDIOI40 Project, value 1.12 M€, funded by the Emilia-Romagna Region on the POR-FESR 2014-2020 funds. The project has the **objective of developing a platform for the creation of Big Data services of wide applicability in the Industry 4.0 field**, considering smart factory as well as smart product scenarios, and involves important companies such as Carpigiani, Cineca, Gea Procomac, Imola Informatica, Injenia, ItalianaSoftware and SACMI.
- Director of master (corso di perfezionamento) "Industry 4.0" of the University of Ferrara, funded by the Emilia-Romagna Region within higher education initiative "Services and Innovation for Industry 4.0 (SI4.0)" in collaboration with the universities of Bologna, Parma and Modena / Reggio Emilia. The master aims to design and implement **educational initiatives to promote the development of extensive and high-level skills capable of satisfying the qualified labor requirement for Industry 4.0, especially in terms of the realization and exploitation of Big Data platforms**.
- **Many active Big Data research collaborations with world leading companies in the Industry 4.0 sector**, such as Carpigiani Group, IMA, Bonfiglioli Riduttori, SACMI, Poggipollini, MEP, Philip Morris International, EMAG, Siemens, PTC, VM Motori, Elenos, and institutions such as IBM TJ Watson, Florida Institute for Human & Machine Cognition, St. John's University, NATO Communications and Information Agency (NCIA).

9/2016-8/2019

**Assistant Professor with tenure track (RTD-B)**

Departments of Engineering (9/2016-11/2018) and of Mathematics and Computer Science (12/2018-8/2019), University of Ferrara, Italy

- **Lead of the Big Data lab of the MechLav Technopole Laboratory**, with the direct coordination of 5 research assistants: [https://ds.unife.it/industrial\\_research/](https://ds.unife.it/industrial_research/)  
The lab participates in many research projects that involve the study and implementation of Big Data platforms for Industry 4.0 applications, both for "shop floor / smart factory" and "smart product" environments - i.e. intelligent devices explicitly designed to operate outside the factory without supervision and to create B2B and B2B2C services.  
The activities of the Big Data laboratory, still presently ongoing, have the main objective of overcoming limits of the main analytics solutions available on the market, analyzing how to build platforms Big Data of general applicability in Industry 4.0 for the analysis of data from different types of machines at different levels of abstraction (single machine, production line and multilane or multi-

plant) and contextual storage of the collected data in order to optimize the use of resources.

- Research unit technical lead for the Green Smart Technology for Water research project (GST4Water), aimed at the development of hardware and software solutions for an informed use of water by citizens and the reuse of gray- and rain-water inside buildings, financed by the Emilia-Romagna Region on POR-FESR 2014-2020 funds.

9/2010-8/2016

### Assistant Professor

Department of Engineering, University of Ferrara, Italy

- **Lead of the Smart Metering lab of the MechLav Technopole Laboratory**, with the direct coordination of 7 research assistants: [https://ds.unife.it/industrial\\_research/](https://ds.unife.it/industrial_research/)  
The activities of the Smart Metering lab, still presently ongoing, have the main objective of designing and implementing ICT prototypes for smart water metering, both at the data acquisition, collection and processing levels, with the ultimate goal of detecting waste.

1/2006-8/2010

### Research Assistant

Department of Engineering, University of Ferrara, Italy

- **Lead designer of "Teorema" Big Data platform for Carpigiani Group**, currently in use in more than 30,000 (thirty thousand) ice cream making machines operating in more than 30 countries around the world and has made it possible to reduce after-sales assistance costs by 25% sales supported by Carpigiani Group worldwide. The Teorema project initiated a long and fruitful research collaboration with Carpigiani Group that is still presently ongoing.

## EDUCATION AND TRAINING

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1/2003-12/2005

### Ph.D. in Computer Engineering

University of Ferrara, Italy

9/1997-10/2002

### Laurea Degree in Electronics Engineering

University of Ferrara, Italy

## WORK ACTIVITIES

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- Official representative of Italy within NATO Science and Technology Organization (STO) Research Task Group (RTG) IST-194 "Adaptive Networks at the Tactical Edge" (3/2022-2/2024).
- Official representative of Italy within NATO Science and Technology Organization (STO) Research Task Group (RTG) IST-176 "Federated Interoperability of Military C2 and IoT Systems", that **investigates innovative service and programming models and middleware for the processing of large amounts of data in constrained environments** (5/2019-4/2023).
- Official representative of Italy within NATO Science and Technology Organization (STO) Research Task Group (RTG) IST-161 "Efficient group and information centric communications in mobile military heterogeneous networks" (4/2019-3/2022).
- Unofficial collaborator of NATO Science and Technology Organization (STO) Research Task Group (RTG) IST-147 "Efficient group and information centric communications in mobile military heterogeneous networks" (1/2018-5/2019).
- Developed a solid experience in cooperating with world-leading industries and universities as (informal) research unit technical lead in the following projects:
  - Project "Water 4.0", funded by the Italian Ministry of Economic Development (2019-2022);
  - Project "Green Smart Technology for Water" (GST4Water), funded by Regione Emilia-Romagna within POR FESR 2014-2020 regional grants (2016-18);
  - Project "SORT", funded by the Italian Ministry of University and Research on Axis II of the National operative programme (PON) for Research and Competitiveness 2007-13 within the call 'Smart Cities and Communities and Social Innovation' (2014-15);
  - Project "Smart Manufacturing 2020", funded by the Italian Ministry of University and Research within the National Technological Clusters call (2013-2015);
  - Project DICET - INMOTO - ORganization of Cultural HEritage for Smart Tourism and Real-time Accessibility (OR.C.HE.S.T.R.A.), funded by the Italian Ministry of University and Research on Axis II of the National operative programme (PON) for Research and Competitiveness 2007-13 within the call 'Smart Cities and Communities and Social Innovation' (2014-15);
- Established numerous collaborations with world leading scientists and institutions, as attested by several publications in international journals and conferences.
  - Since August 2004, he collaborates with the NOMADS Research Team, led by Dr. Niranjani Suri, of the Florida Institute for Human & Machine Cognition (IHMC) on research topics related to the implementation of middleware to support distributed applications in extremely dynamic wireless

- environments. This collaboration originated from a 12-month programme during which Mauro Tortonesi worked as a visiting scientist at the main headquarters of the Florida Institute for Human & Machine Cognition in Pensacola, FL, USA.
- ▣ From 2006 to 2012, he collaborated with the HP Labs of Palo Alto, CA, USA, the research division of Hewlett Packard, in a research project that investigated the business-driven modeling of IT support organizations (the organizational structures in charge of the incident management process in IT service delivery).
  - ▣ From August 2013, he collaborates with Dr. Larisa Schwartz at the IBM TJ Watson research institute of New York, NY, USA, and Prof. Genady Grabarnik at St. John's University of New York, NY, USA, for the business-driven placement of software components in federated Cloud environments.
  - ▣ From July 2015, he collaborates with the Battlefield Information Processing branch (Information Science Division, Computational and Information Sciences Directorate) of the United States Army Research Lab (ARL), as attested by several publications in international journals and conferences. This collaboration originated from a 3-month programme during which Mauro Tortonesi worked as a visiting scientist at the main headquarters of ARL in Adelphi, MD, USA.
- Visiting exchange activities
    - ▣ Visiting scientist at the Florida Institute for Human & Machine Cognition (IHMC), in Pensacola, FL, USA, working within the NOMADS research group led by Dr. Niranjani Suri. (September 2004 - August 2005.)
    - ▣ Visiting scientist at the United States Army Research Lab (ARL) in Adelphi, MD, USA, working within the Battlefield Information Processing branch (Information Science Division, Computational and Information Sciences Directorate) led by Dr. Stephen Russell. (July 2015 - September 2015.)
  - Awards
    - ▣ **Best Student Paper Award at the 2020 IEEE/IFIP Network Operations and Management Symposium (NOMS 2020)** for manuscript F. Poltronieri, M. Tortonesi, A. Morelli, C. Stefanelli and N. Suri, "Value of Information based Optimal Service Fabric Management for Fog Computing," NOMS 2020 - 2020 IEEE/IFIP Network Operations and Management Symposium, Budapest, Hungary, 2020, pp. 1-9, doi:10.1109/NOMS47738.2020.9110359.
    - ▣ **2020 Information Systems Technology (IST) Panel Team Excellence Award**, assigned by the North Atlantic Treaty Organization (NATO) Science and Technology Organization (STO) IST Panel, as unofficial but particularly active member of the NATO STO Research Task Group (RTG) IST-147 "Efficient group and information centric communications in mobile military heterogeneous networks"
  - Associate editor in the editorial boards of
    - ▣ **IEEE Transactions on Network and Service Management** (ISSN: 1932-4537);
    - ▣ Wiley International Journal of Network Management (ISSN: 1055-7148);
    - ▣ Hindawi/Wiley Wireless Communications and Mobile Computing journal (ISSN 1530-8669).
  - Serving / served as co-chair for the organization of the following international conferences and workshops:
    - ▣ The 18th IEEE/IFIP Network Operations and Management Symposium (NOMS 2022) - Co-located Workshops;
    - ▣ 2021 AFCEA/IEEE Military Communications Conference (MILCOM 2021) - Track 2;
    - ▣ The 17th IEEE/IFIP Network Operations and Management Symposium (NOMS 2020) - Co-located Workshops;
    - ▣ 2019 AFCEA/IEEE Military Communications Conference (MILCOM 2019) - Track 2;
    - ▣ The 11th International Conference on Network and Service Management (CNSM 2015);
    - ▣ The 10th IEEE/IFIP International Workshop on Business-driven IT Management (BDIM 2015);
    - ▣ The 14th IFIP/IEEE International Symposium on Integrated Network Management (IM 2015) - Experience Session Track;
    - ▣ The 14th IEEE/IFIP Network Operations and Management Symposium (NOMS 2014) - Special track on the Management of the Internet of Things;
    - ▣ The 9th IEEE/IFIP International Workshop on Business-driven IT Management (BDIM 2014);
    - ▣ The 8th IEEE/IFIP International Workshop on Business-driven IT Management (BDIM 2013);
    - ▣ The 7th IEEE/IFIP International Workshop on Business-driven IT Management (BDIM 2012).
  - Routinely serves as a Technical Program Committee member for the main international conferences and journals in those research areas.
  - Project proposal reviewer for:
    - ▣ Czech Science Foundation;
    - ▣ Fonds Wetenschappelijk Onderzoek (FWO) Vlaanderen (Flemish Research Foundation);
    - ▣ Natural Sciences and Engineering Research Council (NSERC) of Canada.

## PERSONAL SKILLS

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Mother tongue(s) Italian  
Other language(s) English (understanding: C2; speaking: C2; writing: C2)

## ADDITIONAL INFORMATION

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- Publications Total number of publications in peer-review journals: 24  
Total number of citations: 1187 on Google Scholar, 782 on Scopus  
H index: 18 on Google Scholar, 17 on Scopus  
Journal articles:
- "QoS Management Middleware Solutions for Bluetooth Audio Distribution", Journal of Pervasive and Mobile Computing, Elsevier Press, ISSN 1574-1192, Vol. 4, No. 1, pp. 117-138, February 2008. (Coauthors: P. Bellavista, C. Stefanelli.)
  - "Communications Middleware for Tactical Environments: Observations, Experiences, and Lessons Learned", Communications Magazine, ISSN 0163-6804, Vol. 47, No. 1, pp. 56-63, October 2009. (Coauthors: N. Suri, E. Benvegnù, C. Stefanelli, J. Kovach, J. Hanna.)
  - "SYMIAN: Analysis and Performance Improvement of the IT Incident Management Process", IEEE Transactions on Network and Service Management, ISSN 1932-4537 Vol. 7, No. 3, pp. 132-144, September 2010. (Coauthors: C. Bartolini, C. Stefanelli.)
  - "Peer-to-Peer Communications for Tactical Environments: Observations, Requirements, and Experiences", IEEE Communications Magazine, ISSN 0163-6804, Vol. 48, No. 10, October 2010. (Coauthors: N. Suri, G. Benincasa, C. Stefanelli, J. Kovach, R. Winkler, R. Kohler, J. Hanna, L. Pochet, S. Watson.)
  - "Multiple-UAV Coordination and Communications in Tactical Edge Networks", IEEE Communications Magazine, IEEE Communications Society Press, ISSN 0163-6804, Vol. 50, No. 10 (Special Issue on Military Communications), pp. 48-55, October 2012. (Coauthors: C. Stefanelli, E. Benvegnù, K. Ford, N. Suri, M. Linderman.)
  - "Business-Driven IT Management Coming of Age - A Report on the 7th IEEE/IFIP International Workshop on Business-Driven IT Management (BDIM 2012)", Journal of Network and Systems Management, Springer, ISSN 1064-7570, Vol. 21, No. 2, pp. 326-333, June 2013. (Coauthors: M. Brenner, T. Schaaf.)
  - "E-Maintenance for Household and Similar Appliances", International Journal of Productivity and Quality Management, Inderscience, ISSN 1746-6474, Vol. 12, No. 2, pp. 141-160, 2013. (Coauthors: R. Lazzarini, C. Stefanelli, G. Virgilli.)
  - "Enabling the Deployment of COTS Applications in Tactical Edge Networks", IEEE Communications Magazine, IEEE Communications Society Press, ISSN 0163-6804, Vol. 51, No. 10 (Special Issue on Military Communications), pp. 66-73, October 2013. (Coauthors: A. Morelli, C. Stefanelli, R. Kohler, N. Suri, S. Watson.)
  - "Agile Communication Middleware for Next-generation Mobile Heterogeneous Networks", IEEE Software, ISSN 0740-7459, IEEE Computer Society Press, Vol. 31, No. 2 (Special Issue on Next Generation Mobile Computing), pp. 54-61, March-April 2014. (Coauthors: G. Benincasa, A. Morelli, C. Stefanelli, N. Suri.)
  - "Exploring Value of Information-based Approaches to Support Effective Communications in Tactical Networks", IEEE Communications Magazine, Vol. 53, No. 10 (Special Feature on Military Communications), October 2015. (Coauthors: N. Suri, G. Benincasa, R. Lenzi, C. Stefanelli, L. Sadler.)
  - "Information-Centric Networking in Next-generation Communications Scenarios", Journal of Network and Computer Applications, Vol. 80, pp. 232-250, 2017. (Coauthors: A. Morelli, C. Stefanelli, N. Suri.)
  - "An Information-Centric Platform for Social- and Location-Aware IoT Applications in Smart Cities", EAI Endorsed Transactions on Internet of Things, Vol. 3, No. 9. (Coauthors: M. Govoni, J. Michaelis, A. Morelli, N. Suri.)
  - "A middleware solution for wireless IoT applications in sparse smart cities", Sensors (Basel), Vol. 17, No. 11, pp. 2525-2542, November 2017. (Coauthors: P. Bellavista, C. Giannelli, S. Lanzone, G. Riberto, C. Stefanelli.)
  - "Estimating Delay Times between Cloud Datacenters: A Pragmatic Modelling Approach", IEEE Communication Letters, Vol. 22, No. 3, pp. 526-529, March 2018. (Coauthors: W. Cerroni, L. Foschini, G. Grabarnik, L. Shwartz.)
  - "Securing IoT – Enabled Smart City Services – the Military Perspective", European Cybersecurity Journal, Vol. 4, No. 2, pp. 21-26, 2018.
  - "Business-driven Service Placement for Highly Dynamic and Distributed Cloud Systems",

IEEE Transactions on Cloud Computing, Vol. 6, No. 4, pp. 977-990, Oct.-Dec. 2018, DOI: 10.1109/TCC.2016.2541141. (Coauthor: L. Foschini.)

- "Taming the IoT Data Deluge: An Innovative Information-Centric Service Model for Fog Computing Applications", Future Generation Computer Systems, Vol. 93, pp. 888-902, April 2019. (Coauthors: M. Govoni, A. Morelli, G. Riberto, C. Stefanelli, N. Suri.)
- "Smart Appliances and RAMI 4.0: Management and Servitization of Ice Cream Machines", accepted for publication in IEEE Transactions on Industrial Informatics. (Coauthors: A. Corradi, L. Foschini, C. Giannelli, R. Lazzarini, C. Stefanelli, G. Virgilli.)
- "Wireless middleware solutions for smart water metering", Sensors (Basel), Vol. 19, No. 8, Article no. 1853, April 2019. (Coauthors: S. Alvisi, F. Casellato, M. Franchini, M. Govoni, C. Luciani, F. Poltronieri, G. Riberto, C. Stefanelli.)
- "Leveraging Crowdsourcing and Crowdsensing Data for HADR Operations in a Smart City Environment", IEEE Internet of Things Magazine, Vol. 2, No. 2, pp. 26-31, June 2019. (Coauthors: M. Pradhan, F. T. Johnsen, S. Delaitre.)
- "Secured Distributed Processing and Dissemination of Information in Smart City Environments", IEEE Internet of Things Magazine, Vol. 2, No. 2, pp. 38-43, June 2019. (Coauthors: K. Wrona, N. Suri.)
- "HOlistic pRocessing and NETworking (HORNET): An Integrated Solution for IoT-based Fog Computing Services", IEEE Access, Vol. 8, pp. 66707-66721, 2020, doi: 10.1109/ACCESS.2020.2984930. (Coauthors: P. Bellavista, C. Giannelli, D. Padalino Montenero, F. Poltronieri, C. Stefanelli.)
- "A Value-of-Information-based management framework for Fog services", International Journal on Network Management, Vol. 2021, pp. e2156, March 2021. (Coauthors: F. Poltronieri, A. Morelli, C. Stefanelli, N. Suri.)
- "BDMaaS+: Business-driven and Simulation-based Optimization of IT Services in the Hybrid Cloud", IEEE Transactions on Network and Service Management, accepted for publication. (Coauthors: W. Cerroni, L. Foschini, G. Grabarnik, F. Poltronieri, L. Shwartz, C. Stefanelli.)

Patents

- F. Marchi, A. Mazzini, A. Pedroni, C. Stefanelli, M. Tortonesi, "Control system and method of an automatic machine" <https://patents.google.com/patent/WO2014097233A3/en>
- A. Cocchi, M. Tortonesi, C. Stefanelli, R. Lazzarini, "Method and apparatus for making and dispensing liquid or semi-liquid food products" <https://patents.google.com/patent/US20190289876A1/en>
- A. Cocchi, R. Lazzarini, C. Stefanelli, M. Tortonesi, "System for treating food products and corresponding method" <https://patents.google.com/patent/US20210076702A1/en>