



## Curriculum Vitae Europass

# Alessandra Flammini

### Information

Name / Surname **Alessandra Flammini**  
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citizenship Italian  
Birth date 31/01/1960  
Sex F  
Marital Status Married with Giorgio Mentasti, 2 daughters  
FISCAL CODE FLMLSN60A71B157U

### Job

Full professor (scientific disciplinary sector ING-INF / 07, Electrical and electronic measurements) at the Department of Information Engineering, University of Brescia  
**ORCID** <https://orcid.org/0000-0002-2046-0720>

### Professional experience

Date **Since 1/1/2016**  
Occupation or position held Full Professor ING-INF/07  
Main activities and responsibilities Research, teaching and technology transfer activities (see below). Head of the research group "Embedded Systems and Smart Sensors" <https://es3.unibs.it/> composed of 3 full professors, 2 associate professors, 2 researchers and holders of research grants and doctoral students. Head of the eLUX interdepartmental laboratory <https://elux.unibs.it/>. Responsible for educational electronics labs  
Nome e indirizzo del datore di lavoro Department of Information Engineering, University of Brescia  
Date **from 31/12/2002 to 31/12/2015**  
Occupation or position held Associate Professor ING-INF/07, Electrical and electronic measurements  
Main activities and responsibilities Research, teaching and technology transfer activities. Head of the research group "Embedded Systems and Smart Sensors" <http://es3.unibs.it/> composed of 3 researchers and holders of research grants and doctoral students. Responsible for educational electronics labs  
Name and address of the employer Department of Information Engineering, University of Brescia  
Date **From 2/10/1995 to 31/12/2002**  
Occupation or position held Assistant Professor ING-INF/01, Electronics

Main activities and responsibilities	Research activities, teaching support and technology transfer. Responsible for educational electronics labs
Name and address of the employer	University of Brescia, Electronics Dept. for Automation
Date	<b>1994-1995</b>
Occupation or position held	Attendance at Health Physics for the purpose of improvement, realization of electronic instruments for biomedical use, study and calibration of instruments in the sector of non-ionizing radiation
Main activities and responsibilities	Research and service activities in the field of non-ionizing radiation
Name and address of the employer	Institute of Health Physics of the Civil Hospital of Brescia, Spedali Civili di Brescia, Piazzale Spedali Civili, 25100 Brescia, (BS), Italy
Date	<b>1994-1995</b>
Occupation or position held	Contract Professor
Main activities and responsibilities	Contract Professor of the Electronic Systems Digital Course
Name and address of the employer	University of Brescia, Electronics Dept. for Automation
Date	<b>1992 - 1993</b>
Occupation or position held	Electronics Manager
Main activities and responsibilities	Design and management of electronic systems for electromagnet control
Name and address of the employer	SGM (Electromagnetic Constructions), SGM s.p.a, via Leno 2,D, 25025 Manerbio, Brescia, Italy
Type of business or sector	Metalworking company (lifting / magnetic separation)
Date	<b>1985 - 1992</b>
Occupation or position held	Sector manager with framework qualification
Main activities and responsibilities	During this period she managed the research and development section on digital drives controls, taking care of the design of the control electronics, supervision, diagnostics and interface of drives. Among the most significant topics of this period, in addition to the organization of the research activities of more than 10 people, including graduates and graduates, the development of microprocessor controls for drives for DC machines and the design of field buses stand out for diagnostics and management of drives.
Name and address of the employer	Ansaldo Sistemi industriali, power electronics division, Viale Sarca 336, 20100 Milano, Italy
Type of business or sector	Engineering company (drives and industrial plants), Design and Development sector of the Power Electronics division
<b>Education</b>	
Date	<b>28/02/1985</b>
Qualification awarded	Degree in Physics (110 with honors), University of Rome La Sapienza, Thesis Title "project and realization of a seven-decade exposure dose rate meter managed by a microprocessor" Supervisor Prof. A. Serra
Date	<b>1979</b>
Qualification awarded	Scientific high school diploma, Massimiliano Massimo Scientific High School, Rome (score 60/60)

## Teaching activity

Her **teaching activity**, starting from 1998, includes the teaching of numerous curricular courses in the fields of electronics, embedded systems and instrumentation for industrial automation. Among the courses active in the AA2020-2021 there are: "General Electronics", 9 CFU, of the Degree Course of Computer Engineering, "Systems for Industry and PLC", 6CFU, of the Degree Course of Electronic Engineering, "Electronic Systems for Automation and Industry", 6CFU, of the Degree Course in Technology Engineering for the Digital Enterprise. She has actively participated in the establishment of the new Degree course in Technology Engineering for the Digital Enterprise, active since A.A. 2020-2021. Supervisor of more than 100 degree theses and tutor of numerous doctoral students, she pays close attention to teaching activities in the laboratory.

## Research activity

Her research activity has developed to date through the digital processing systems of signals from sensors, sensor networks and IoT. She is the head of a multidisciplinary research group, including professors and researchers of ING-INF/07 Measurements, ING-INF/01 Electronics and ING-IND/33 Electrical Systems. Among the most important activities there are innovative techniques of linearization of the characteristic of the sensors, new methods of management of signals from position sensors (LVDT, encoder) and creation of numerical instrumentation, such as high-performance frequency meters, effect-based stress analyzers Barkhausen and low-cost electronic noses, an area in which she has authored several methods for interfacing with variable range resistive sensors (from kOhm to hundreds of GOhm). For over a decade, research has also extended to sensor networking. Starting from the previous industrial experience on field buses, he has carried out research in the field of intelligent sensors, with studies on the different application aspects of the IEEE1451 standard. Particularly noteworthy are the studies on the creation of web sensors and, more generally, on the use of Ethernet at field level and on synchronization. He collaborated in the creation of the GDNET network of Gefran S.p.A., a proprietary Real Time Ethernet network for remote real-time management (less than 1ms) of sensors and actuators. Recently, attention has turned to instrumentation for Real Time Ethernet networks and to wireless sensor networks, where application solutions based on various technological solutions have been designed, including IEEE802.11, Bluetooth, GSM / GPRS, DECT, WUSB, ZigBee and, particularly LoRaWAN. Particular attention is paid to the problems of adherence to real time and synchronization of networks of sensors and actuators in the industrial sector, an area in which she has received awards and funding. Her attention has recently focused on new technologies for industrial communications (WirelessHART, LoRaWAN) and Software Defined Networking, studying new types of instrumentation for performance and coexistence analysis. Since 2009 she has dealt with systems and infrastructures to support energy distribution (Smart-grid, IEC61850), including the charging of electric vehicles, and since 2011 she has been studying smart sensors integration on Smartphone, also developing a framework available on github (<https://es3.unibs.it/SAndroidE/>) with particular reference to ambient assisted living and improvement of life style. She heads the research group Embedded Systems and Smart Sensors (<https://es3.unibs.it>) made up of 3 full professors, 3 associate professors and 4 assistant professors. Her recent research activities are focused on laboratory on smart grids and smart living eLUX, directed by her (<https://elux.unibs.it/>), and on the wireless distributed measurements for industrial systems including the new Industrial Internet of Things laboratory for which she received financial support from 5 territorial realities. In addition to teaching and research, she carries out assignments, manages many financed projects and has obtained important awards.

## Assignments

Since 1997 she directs the research group Embedded Systems and Smart Sensors (<https://es3.unibs.it>) which today consists of 3 full professors, 2 associate professors, 2 researchers and holders of research grants and doctoral students.

From 1999 IEEE member (Senior Member from 2010) and from 2013 to 2016 she was in the AdCom of the IEEE Instrumentation & Measurement Society and from 2014 to 2015 she was vice President for Conferences

From 2002 to today she has been in charge of the Educational Electronics Laboratories.

From 2002 for over 6 years she has been responsible for the Electronics laboratory and since 2004 she has created a PROFIBUS and PROFINET laboratory which has become the only national competence center of the PNI (Profibus Network Italy), active at the CSMT, assuming scientific responsibility since 2008 until 2014.

She has held various roles for her department and for her university, including manager of the Internship Commission, responsible for orientation, member of the Commission for the drafting of the Statute L.240

Since 2004 she has been part of the 65C (Digital Communications for Control Systems) subcommittee of the Technical Committee 65 (Control and measurement in industrial processes) of the CEI (Italian Electrotechnical Committee).

In 2009 she was General Co-Chair of ISPCS2009, International IEEE Symposium on synchronization

Reviewer PRIN2009 and FIRB 2010 and of numerous international scientific journals.

From 2000 to 2013 she was part of the Department Internship Commission,

From 2000 to 2010 she was part of the Department Internship Committee.

From 2010 to 2012 she was part of the Faculty Orientation Commission,

Referent since 2011 for the University of Brescia of the Apple "iOS Developer University Program", Member of the Commission of the University of Brescia for the preparation of the Statute (art.2 paragraph 5 L.240 / 2010).

Since 2011 in the technical committee of the Automation Today magazine of Fiera Milano Editore (ISSN 0392-8829) and in the scientific committee of the SPS Automation Fair.

Outstanding Reviewer of 2011 (IEEE Trans. On Instrum. & Measurement).

Reviewer of international journals (IEEE Trans. On Instrum. & Meas., IEEE Trans. On Industrial Informatics, Sensors & Actuators)

In 2012, 2014 and 2015 she was General Co-Chair (Technical co-Chair in 2013) of SAS, IEEE Symposium on sensors.

From 2012 to 2015 she was responsible for "Measures for industry" of the Electrical and Electronic Measurements Group (GMEE)

Since 2013 she has sat in the Study Group of the IEEE1588 standard.

Since 2013 to 2021 she has been on the Board of Directors of CSMT Gestione scarl.

In 2015 she has Industry Chair of I2MTC2015, the most important international conference on measurements, and in 2016 she was Technical co-Chair of I2MTC2016.

Belonging to the Technical Program Committee (TPC) and Session Chair of numerous conferences international (I2MTC, ISPCS, ICST, SAS, AMPS, AMUEM, STREAM, DSD, ETFA, WFCS)

Referent for the University of agreements with international research bodies (University of Vienna -AT-, University of Aachen -DE-, Hanyang University -KR-)

Since 2015 she has been sitting at the table of the Smart Cities and Communities regional cluster.

Since 2018 she has chaired the scientific Committee of eLUX, the University laboratory on Smart Grids and Smart Living (<https://elux.unibs.it>)

Since the end of 2018 she has been elected as the President of the Degree Course Council for three Degree Courses: Laurea degree in Electronics and Communications, Master of Science in Electronics, and Master of science in Communication technology and Multimedia.

Form the end of 2020 to the end of 2022 she has been elected as the Coordinator of the PhD Technology for Health of University of Brescia

## Awards and indices

In 2008 she was co-author of the work awarded at the ETFA 2008 International Conference as "Best Work in Progress" ("Clock synchronization of PTP-based devices through PROFINET IO networks").  
 In 2010 she was co-author of the work awarded at the ISPCS2010 International Conference as "Best Paper" ("Wireless sensors exploiting IEEE802.15.4a for precise timestamping")  
 She is included in the Top Italian Scientists for the Engineering sector ([https://topitalianscientists.org/tis/47775/Alessandra\\_Flammini\\_-\\_Top\\_Italian\\_Scientist\\_in\\_Engineering](https://topitalianscientists.org/tis/47775/Alessandra_Flammini_-_Top_Italian_Scientist_in_Engineering)) and in Guide2Research (<https://www.guide2research.com/u/alessandra-flammini>).  
 She is included in the 100esperte list in the STEM Area (<https://100esperte.it/search?id=550>)  
 She is in top3% in the world ranking (mondiale (Total i10 Index, <https://www.adscientificindex.com/scientist/alessandra-flammini/1874083>)  
 She has been elevated to the 2024 Class of IEEE Fellows for her contributions to wireless distributed measurements for industrial systems ([https://en.wikipedia.org/wiki/Alessandra\\_Flammini](https://en.wikipedia.org/wiki/Alessandra_Flammini) , <https://www.ieee.org/membership/fellows/fellows-directory.html>)  
 She is the author of more than 330 international publications (Scopus), holds national and international patents, has received more than **5000 citations** and her **h-index is 39 according to Scopus**; according to **Scholar**, she received more than **7500 citations** and **h-index is 49**.

## Financed Projects

She was responsible for the Brescia unit of the PRIN2005 project "Study and development of methods and tools for measuring performance of Real-Time Ethernet networks for industrial applications" and of the PRIN2008 project "Methodologies and measurement techniques for space location - temporal in wireless sensor networks".  
 In 2013 she was the winner of a private tender from ABB - ABB Research Grant Program - on all world universities with a project entitled "Advanced Industrial Real-Time Ethernet Network Co-Simulation - AIRnet"  
 In 2013 she was the winner of a project launched by the University of Brescia on EULO funds entitled "Smart ECG".  
 Since 2012 she has been appointed by the Rector to coordinate the activities relating to the Smart Cities calls.  
 Since 2014 she has managed, as manager for the University of Brescia, two important interdepartmental projects financed by the Lombardy Region call 2013 Smart Cities and Communities: SCUOLA - Sustainable Campuses as Urban Open-Lab Areas (smart grid, A2A leader) and Smart Break "Bialetti Restoration Adaptive Kit" (Ambient Assisted Living, life style and food, leader Bialetti).  
 Since 2014 she has been managing three projects of the MIUR Smart Cities and Communities and Social Innovation call 2012:  
 - Brescia Smart Living: Energia e servizi integrati per la valorizzazione del benessere- project (smart grids, gas metering, public lighting, waste management, ambient assisted living, A2A Manager). Responsible for the University  
 - SMART AGING –Piattaforma di servizi per acquisizione e elaborazione di dati personali per il prolungamento della vita attiva e il miglioramento del benessere, della cura e della prevenzione nella popolazione anziana - interdepartmental project (aging of the society, wellbeing). Responsible for the Department.  
 - SWARM-net Smart Water Resource Management – Networks (water management, IRSA-CNR manager)  
 Since 2016 she has been in charge of the eLUX interdepartmental laboratory on smart grids and smart living <http://elux.unibs.it/>  
 Since 2020 she is responsible for her Dept. for the project MoSoRe@Unibs Infrastrutture e servizi per la Mobilità Sostenibile e Resiliente (Mobility, UNIBS leader) financed by the Lombardy Region call HUB Ricerca e Innovazione 2019.  
 Since 2022 she is the scientific reference for UNIBS of Spoke 5 –Light Vehicle and Active Mobility – of MOST – Sustainable Mobility National Research Center – funded by the European Union Next-GenerationEU (PIANO NAZIONALE DI RIPRESA E RESILIENZA (PNRR) – MISSIONE 4 COMPONENTE 2, INVESTIMENTO 1.4 – D.D. 1033 17/06/2022, CN00000023)  
 Since 2005 she has been responsible for more than 15 research contracts (third parties) with national companies.

## Personal skills and competences

Mother tongue (s)	Italian language
Other language (s)	English (good reading, writing and oral comprehension skills)

Technical skills and competences	Programming of processors, embedded systems and PLCs
Social skills and competences	
Organizational skills	Professional experiences of coordination and personnel management (Ansaldo, technical staff of the electronics laboratories of the University of Brescia) and of research activities (research group "embedded systems and smart sensors" that she has set up: 3 full professors, 3 associate professors, 4 assistant professors, holders of research grants, doctoral students) Belonging to the board of directors of the I Soliti Ignoti cultural association, active in the world of entertainment and musicals Founder of the dance group MJ20-60 who performs on choreography inspired by Michael Jackson
Artistic skills	Dance (Hip-hop, Michael Jackson Style), acting and musical experiences
Other skills and competences	Tennis, golf
Driving license	Car license type B
<b>Other Information or attached file</b>	none

## Most recent publications

- P. Ferrari, P. Bellagente, A. Depari, A. Flammini, M. Pasetti, S. Rinaldi, E. Sisinni, "Resilient time synchronization opportunistically exploiting UWB RTLS infrastructure", 2022 IEEE Trans. Instrumentation and Measurement, Vol.71, ISSN 0018-9456, DOI 10.1109/TIM.2021.3132354.
- P. Ferrari, E. Sisinni, P. Bellagente, D. Fernandes Carvalho, A. Depari, A. Flammini, M. Pasetti, S. Rinaldi, I. Silva, "On the use of LoRaWAN and cloud platforms for diversification of mobility-as-a-service infrastructure in smart city scenarios", 2022 IEEE Trans. Instrumentation and Measurement, Vol.71, ISSN 0018-9456, DOI 10.1109/TIM.2022.3144736.
- P. Ferrari, P. Bellagente, A. Depari, A. Flammini, M. Pasetti, S. Rinaldi, E. Sisinni, "Resilient time synchronization opportunistically exploiting UWB RTLS infrastructure", 2021 IEEE Transactions on Instrumentation and Measurement, in press, ISSN 00189456, DOI 10.1109/TIM.2021.3132354
- E. Sisinni, D. Fernandes Carvalho, P. Ferrari, A. Flammini, M. Gidlund, M., "Adding redundancy to LoRaWAN for emergency communications at the factory floor", 2021 IEEE Transactions on Industrial Informatics, in press, ISSN 15513203, DOI 10.1109/TII.2021.3124054
- L. C. Tagliabue, F. Re Cecconi, S. Maltese, S. Rinaldi, A. L. C. Ciribini, A. Flammini, "Leveraging digital twin for sustainability assessment of an educational building", Sustainability, January, 2021, Vol. 13, N. 2, pp. 480, ISSN 2071-1050, DOI 10.3390/su13020480.
- P. Ferrari, E. Sisinni, A. Depari, A. Flammini, M. Pasetti, S. Rinaldi, "Experimental characterization of an IoT framework leveraging mobile wireless technologies", 2021 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Virtual Conference, May 17-20, 2021, pp. 1-6, ISBN 978-1-7281-9539-1, DOI 10.1109/I2MTC50364.2021.9459836.
- A. Depari, E. Sisinni, P. Bellagente, P. Ferrari, A. Flammini, S. Rinaldi, "Simple and robust microcontroller-based acquisition system for differential capacitive sensors", 2021 IEEE International Instrumentation and Measurement Technology Conference (I2MTC), Virtual Conference, May 17-20, 2021, pp. 1-6, ISBN 978-1-7281-9539-1, DOI 10.1109/I2MTC50364.2021.9460034.
- P. Ferrari, E. Sisinni, P. Bellagente, A. Depari, D. Fernandes Carvalho, A. Flammini, M. Pasetti, S. Rinaldi, "Turning old into new: adding LoRaWAN connectivity to PLC in brownfield installations", 2021 IEEE International Workshop on Metrology for Industry 4.0 & IoT (MetroInd4.0&IoT), Virtual Event, June 7-9, 2021, pp. 665-670, ISBN 978-1-6654-1979-6, DOI 10.1109/MetroInd4.0IoT51437.2021.9488564.
- E. Sisinni, P. Bellagente, A. Depari, D. Fernandes Carvalho, A. Flammini, M. Pasetti, S. Rinaldi, P. Ferrari, "Investigating redundancy of LoRaWAN for emergency notifications in industrial plants", 2021 17th IEEE International Workshop on Factory Communication Systems (WFCS), Linz, Austria, June 9-11, 2021, pp. 15-18, ISBN 978-1-6654-2478-3, DOI 10.1109/WFCS46889.2021.9483609.
- A. Depari, P. Bellagente, P. Ferrari, A. Flammini, M. Pasetti, S. Rinaldi, E. Sisinni, "Versatile and low-cost sensor interface for IoT-ready odor monitoring in wastewater management", 2021 IEEE Sensors Applications Symposium (SAS), Virtual Conference, August 23-25, 2021, pp. 1-6, ISBN 978-1-7281-9431-8, DOI 10.1109/SAS51076.2021.9530094.
- D. Fernandes Carvalho, P. Ferrari, A. Flammini, E. Sisinni, "Improving Redundancy in LoRaWAN for Mixed-Criticality Scenarios", IEEE Systems Journal, September, 2021, Vol. 15, N. 3, pp. 3682-3691, ISSN 1932-8184, DOI 10.1109/JSYST.2020.3015274.
- S. Rinaldi, P. Ferrari, E. Sisinni, A. Depari, A. Flammini, "An Evaluation of Low-Cost Self-Localization Service Exploiting Angle of Arrival for Industrial Cyber-Physical Systems", 2021 IEEE AFRICON, Arusha, Tanzania, September 13-15, 2021.
- M. Pasetti, S. Rinaldi, P. Bellagente, A. Depari, P. Ferrari, A. Flammini, E. Sisinni, "Impact of the Measurement Time Resolution on Energy Key Performance Indicators for Distributed Energy Resources: An Experimental Analysis", 2021 IEEE 11th International Workshop on Applied Measurements for Power Systems (AMPS), Virtual Workshop, September 29 - October 1, 2021, pp. 1-6, ISBN 978-1-7281-6923-1.
- M. Pasetti, E. Sisinni, P. Ferrari, S. Rinaldi, A. Depari, P. Bellagente, D. Della Giustina, A. Flammini, "Evaluation of the Use of Class B LoRaWAN for the Coordination of Distributed Interface Protection Systems in Smart Grids", Journal of Sensor and Actuator Networks, March, 2020, Vol. 1, N. 9, pp. 13, ISSN 2224-2708, DOI 10.3390/jsan9010013.
- E. Sisinni, P. Ferrari, D. Fernandes Carvalho, S. Rinaldi, M. Pasetti, A. Flammini, A. Depari, "LoRaWAN Range Extender for Industrial IoT", IEEE Trans. Industrial Informatics, August, 2020, Vol. 16, N. 9, pp. 5607-5616, ISSN 1551-3203, DOI 10.1109/TII.2019.2958620.
- E. Sisinni, A. Depari, A. Flammini, G. Ferri, V. Stornelli, G. Barile, "Full-analog parasitic capacitance compensation for AC-excited differential sensors", IEEE Trans. Instrumentation and Measurement, August, 2020, Vol. 69, N. 8, pp. 5890-5899, ISSN 0018-9456, DOI 10.1109/TIM.2019.2962296.
- S. Rinaldi, M. Pasetti, F. Bonafini, P. Ferrari, A. Flammini, E. Sisinni, G. Artale, A. Cataliotti, V. Cosentino, D. Di Cara, N. Panzavecchia, G. Tine', "Design of a Time Dissemination System using Chirp Modulation for Medium Voltage Smart Grid Applications", IEEE Trans. Instrumentation and Measurement, September, 2020, Vol. 69, N. 9, pp. 6686-6695, ISSN 0018-9456, DOI 10.1109/TIM.2020.2975372.
- P. Ferrari, E. Sisinni, A. Depari, A. Flammini, S. Rinaldi, P. Bellagente, M. Pasetti, "On the Performance of Cloud Services and Databases for Industrial IoT Scalable Applications", Electronics, September, 2020, Vol. 9, N. 9, pp. 1435, ISSN 2079-9292, DOI 10.3390/electronics9091435.

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016 and to Legislative Decree 30 June 2003, n. 196 "Code regarding the protection of personal data", I hereby express my consent to process and use my data provided in this CV.

Brescia, 20/04/2022

Signature

