

## Personal Information

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## CURRENT POSITION

01/03/2023 – present: **Assistant Professor (RTDa)**

Università degli Studi di Pavia – Department of Electrical, Computer & Biomedical Engineering, via Ferrata 5, 27100, Pavia (PV), Italy

## PROFESSIONAL EXPERIENCES

07/01/2020 – 28/02/2023: **Systems Administrator**

Università degli Studi di Pavia – Area Sistemi Informativi (ASI), UOC Cloud & Sistemi, via Ferrata 5, 27100, Pavia (PV), Italy

01/12/2017 – 30/11/2019: **Post-doc**

Università degli Studi di Pavia – Dipartimento di Scienze del Sistema Nervoso e del Comportamento (DBBS), Neurocomputation Laboratory, via Forlanini 6, 27100, Pavia (PV), Italy

01/12/2017 – 30/11/2019: **Post-doc**

Università degli Studi di Pavia – Department of Electrical, Computer & Biomedical Engineering, via Ferrata 5, 27100, Pavia (PV), Italy

## EDUCATION

01/11/2010 – 31/10/2013; final exam 10/02/2014: **PhD in Bioengineering and Bioinformatics**

Università degli Studi di Pavia – Dipartimento di Ingegneria Industriale e dell'Informazione (DIII), via Ferrata 5, 27100, Pavia (PV), Italy

01/10/2007 – 26/04/2010: **Master's Degree in Biomedical Engineering**

Università degli Studi di Pavia – via Ferrata 5, 27100, Pavia (PV), Italy

01/10/2004 – 13/12/2007: **Bachelor's Degree in Biomedical Engineering**

Università degli Studi di Pavia – via Ferrata 5, 27100, Pavia (PV), Italy

## RESEARCH INTERESTS

- Signal processing, machine & deep learning for biosignals & medical hyperspectral images;
- IoT & embedded systems;
- High Performance Computing (HPC);
- Modeling & simulation of cerebellum neuronal circuits.

## AWARDS

- 05/2016: recognition of the Laboratorio di Custom Computing & Programmable Systems as **NVIDIA GPU Research Center**
- 12/09/2014: **ETIC Award** (ICT & Ethics), promoted by Rotary & AICA (Italian Association for Informatics & Automatic Calculus) per the PhD thesis
- 14/06/2012: **Lifability Award** – Innovazione Social & Technological Innovation, Bioengineering & Biotechnology sector, promoted by Lions International
- 11/06/2012: **Third Prize Award - R&I for Industry**, promoted by Confindustria Pavia (regional hub of the Italian Association of Industries)
- 08/02/2012: **Second Prize as Best Student Paper Award**, sponsored by IEEE Instrumentation and Measurement Society for the scientific paper presented at the IEEE Sensors Applications Symposium (SAS 2012, Brescia, Italy)
- 06/2010: **Master's Degree Award in memory of Prof. Domenico Dotti**, for theses in the fields of microprocessors systems, biomedical instrumentation and high-performance computing.

## RESEARCH ACTIVITIES

- “STRATUM – 3D Decision Support Tool for brain guidance and diagnosis”, funded by the European Union Horizon Europe Programme HORIZON-IA, grant agreement N°101137416.
- AVIO - Airport Virtual Infrastructure Operation, funded by the Italian Ministry of Industries & Made in Italy
- TRUSTINAGEING (*smarT senioR hoUsing to counteract Social isolaTion and for an IndepeNdent, safe, healthy and active AGEING*), funded by the Italian Ministry of Health
- Azcom Technology s.r.l.: design and development of radar systems and Artificial Intelligence approaches for human activity recognition in the field of ambient assisted living
- High Performance Computing for Image Processing, University of Las Palmas de Gran Canaria & University of Extremadura
- European Flagship Initiative The Human Brain Project – SP6 SGA2, ID 785907
- TheDALUS - The Disable Assisted Living for University Students, funded by Lombardy Region as part of the Smart Living funding scheme - ID 379357
- ASSOMAC - National Assotiation of Italian Manufacturers of Shoes, Leather Goods and Tannery Technologies: national standard “SPRINTS” for the interoperability between machines for shoes production
- REFLECT (*REsponsive FLExible Collaborating ambienT*), n. 215893, funded by the European Commission’s Seventh Framework Programme – FP7

### EDITORIAL ACTIVITIES

- *Handling Editor* for the Elsevier journal “Microprocessors and Microsystems (MicPro)”, since 2023
- *Guest editor* for the Elsevier journal “Microprocessors and Microsystems (MicPro)” - special issue in European Projects in Digital Systems Design, since 2023
- *Review editor* (editorial board member) for the journal “Frontiers in Computational Neuroscience”, since 2023
- *Co-chair of the scientific committee*: session & track co-chair “Advanced Systems for Health Wellness and Personal Monitoring (ASHWPA)” - Euromicro Conference Series on Digital System Design (DSD), 2024 – present
- *Program Committee member* for the Special Session on European Projects in Digital Systems Design (EPDSD), Euromicro Conference Series on Digital System Design (DSD), years: 2018, 2019, 2021 – present
- *Program Committee member* per la Special Session on Advanced Systems for Health Wellness and Personal Monitoring (ASHWPA), Euromicro Conference Series on Digital System Design (DSD), years: 2018, 2019, 2021 - 2023
- *Program Committee member* per la Special Session on High Performance Computing for Neuroscience at the Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP), years: 2018 – 2020

*Reviewer for international journal*: Microprocessors and Microsystems, casa editrice Elsevier, 2014-in corso

*Reviewer for international conferences*:

- Euromicro International Conference on Digital System Design (DSD), main track, 2014 - 2022
- Euromicro International Conference on Digital System Design (DSD) special session in European Projects in Digital Systems Design, 2014-present
- Euromicro International Conference on Digital System Design (DSD) special session in Advanced Systems in Healthcare, Wellness and Personal Assistance, years: 2014 - 2022, 2024
- 11<sup>th</sup> Mediterranean Conference on Embedded Computing (MECO), 2022
- Euromicro International Conference on Parallel, Distributed, and Network-Based Processing (PDP), main track, years: 2016, 2018 – 2020, 2025

### CONFERENCES PRESENTATIONS

- 11<sup>th</sup> Mediterranean Conference on Embedded Computing (MECO), 7-10 June 2022
- IEEE Global Engineering Education Conference (EDUCON), 17-20 April 2018
- 25<sup>th</sup> Euromicro International Conference on Parallel, Distributed and Network-based Processing (PDP), 6-8 March 2017
- International Conference on Physiological Computing Systems (PhyCS), 7-9 January 2014
- IEEE EUROCON, 1-4 July 2013
- IEEE Sensors Applications Symposium (SAS), 7-9 February 2012

### TEACHING ACTIVITIES

- PhD course, in collaboration with Prof. Loporati and Torti, in “*Embedded systems design, communication and data acquisition*”, as part of the PhD in Electronics, Computer Science and Electrical Engineering, Università degli Studi di Pavia, Italy
- “*Embedded Systems for Biomedical Applications*”, part of the Master’s Degree in “Artificial Intelligence for Science and Technology” in collaboration between Università degli Studi di Milano Statale, Università degli Studi di Milano Bicocca and Università degli Studi di Pavia

## PUBLICATIONS

### *International Journals*

1. Torti E.; Migliazza S.; **Marenzi E.**; Danese G.; Loporati F.; “Parallel Simulations of the Sharp Wave-Ripples of the Hippocampus on Multicore CPUs and GPUs”, *Applied Sciences*, vol. 14, issue 21, pp. 1-17, 2024, DOI: 10.3390/app14219967
2. De Vittorio D.; Barili A.; Danese G.; **Marenzi E.**; “Artificial Intelligence for the Evaluation of Postures Using Radar Technology: A Case Study”, *Sensors*, vol. 24, issue 19, pp. 1-26, 2024, DOI: 10.3390/s24196208
3. Vujosevic S.; Limoli C.; Piccoli G.; Costanzo E.; **Marenzi E.**; Torti E.; Giannini D.; Polito M.S.; Luzi L.; Nucci P.; Parravano M.; “A Gender-Based Analysis of Retinal Microvascular Alterations in Patients with Diabetes Mellitus Using OCT Angiography”, *Journal of Diabetes and its Complications*, vol. 38, issue 10, pp. 1-7, 2024, DOI: 10.1016/j.jdiacomp.2024.108852
4. Vujosevic S.; Alovisi C.; Piccoli G.; Brambilla M.; Torti E.; **Marenzi E.**; Loporati F.; Luzi L.; Nucci P.; “Severity of Disorganization of Retinal Layers and Visual Function Impairment in Diabetic Retinopathy”, *Ophthalmology Retina*, vol. 8, issue 9, pp. 880-888, 2024, DOI: 10.1016/j.oret.2024.04.005
5. Torti E.; Gazzoni M.; **Marenzi E.**; Loporati F.; “GPU-based key frame selection of pulmonary ultrasound images to detect COVID-19”, *Journal of Real-Time Image Processing*, vol. 21, issue 4, pp. -, 2024, DOI: 10.1007/s11554-024-01493-x
6. La Salvia M.; Torti E.; **Marenzi E.**; Danese G.; Loporati F.; “Edge and Cloud Computing approaches in the early diagnosis of skin cancer with Attention-Based Vision Transformer through Hyperspectral Imaging”, *Journal of Supercomputing*, vol. 80, issue 11, pp. 16368-16392, 2024, DOI: 10.1007/s11227-024-06076-y
7. Petracchi B.; Torti E.; **Marenzi E.**; Loporati F.; “Acceleration of Hyperspectral Skin Cancer Images Classification Through Parallel Machine Learning Methods”, *Sensors*, vol. 24, issue 5, pp. 1-16, 2024, DOI: 10.3390/s24051399
8. Guerra B.M.V.; Torti E.; **Marenzi E.**; Schmid M.; Ramat S.; Loporati F.; Danese G.; “Ambient Assisted Living for Frail People through Human activity Recognition: State-of-the-Art, Challenges and Future Directions”, *Frontiers in Neuroscience*, vol. 17, pp. 1-18, 2023, DOI: 10.3389/fnins.2023.1256682
9. Torti E.; **Marenzi E.**; Danese G.; Plaza A.; Loporati F.; “Spatial-Spectral Feature Extraction with Local Covariance Matrix from Hyperspectral Images through Hybrid Parallelization”, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 16, pp. 7412-7421, 2023, DOI: 10.1109/JSTARS.2023.3301721
10. Casali S.; **Marenzi E.**; Medini C.; Casellato C.; D’Angelo E.; “Reconstruction and simulation of a scaffold model of the cerebellar network”, *Frontiers in Neuroinformatics*, pp. 13-37, 2019, DOI: 10.3389/fninf.2019.00037
11. Fontanella A.; **Marenzi E.**; Torti E.; Danese G.; Plaza A.; Loporati F.; “A Suite of Parallel Algorithms for Efficient Band Selection from Hyperspectral Images”, *Journal of Real-Time Image Processing*, pp. 1-17, 2018, DOI: 10.1007/s11554-018-0765-0
12. **Marenzi E.**; Torti E.; Loporati F.; Quevedo E.; Marrero Callicò G.; “Block Matching Super-Resolution Parallel GPU Implementation for Computational Imaging”, *IEEE Transactions on Consumer Electronics*, vol. 63, issue 4, pp. 368-376, 2017, DOI: 10.1109/TCE.2017.015077
13. Cristiani A.; Bertolotti G.M.; **Marenzi E.**; Ramat S.; “An Instrumented Insole for Monitoring Movement, Comfort and Ergonomics”, *IEEE Sensors Journal*, vol. 14, issue 5, pp. 1564-1572, 2014, DOI: 10.1109/JSEN.2014.2299063
14. **Marenzi E.**; Bertolotti G.M.; Cristiani A.; “Design and development of a monitoring system for the interface pressure measurement of seated people”, *IEEE Transactions on Instrumentation and Measurement*, pp. 570-577, vol. 62, issue 3, 2013, ISSN 0018-9456, INSPEC 13284829, DOI 10.1109/TIM.2013.2240051

### *International Conferences*

1. Fabelo H.; Leon R.; Torti E.; Marco S.; Verbers M.; Falevoz Y.; Ramallo-Fariña Y.; Weis C.; Wägner A.M.; Juarez E.; Rial C.; Lagares A.; Burström G.; Loporati F.; **Marenzi E.**; Cervero T.; Moreto M.; Danese G.; Zinger S.; Manni F.; Alvarez-Male M.L.; Morera J.; Clavo B.; Gustavo M. Callicò G.M. & STRATUM Consortium, “3D Decision Support Tool for Brain Tumour Surgery: The STRATUM Project”, 27<sup>th</sup> Euromicro Conference on Digital System Design (DSD), 28-30/08/2024, Parigi, Francia, DOI: 10.1109/DSD64264.2024.00065

2. Gazzoni M.; Torti E.; **Marenzi E.**; Danese G.; Loporati F.; "HS2RGB: an Encoder Approach to Transform Hyper-Spectral Images to Enriched RGB Images", 27<sup>th</sup> Euromicro Conference on Digital System Design (DSD), 28-30/08/2024, Parigi, Francia, DOI: 10.1109/DSD64264.2024.00070
3. Ragusa D.; Rodriguez-Almeida A.J.; Gazzoni M.; Torti E.; **Marenzi E.**; Fabelo H.; Callicò G.M.; Loporati F.; "FPGA Design of Digital Circuits for Phonocardiogram Pre-Processing Enabling Real-Time and Low-Power AI Processing", 27<sup>th</sup> Euromicro Conference on Digital System Design (DSD), 28-30/08/2024, Parigi, Francia, DOI: 10.1109/DSD64264.2024.00084
4. Di Meo S.; Torti E.; **Marenzi E.**; Gandolfi R.; Pasian M.; Loporati F.; "Preliminary Hyperspectral Characterization of Tissue-Mimicking Breast Phantoms", 2024 IEEE MTT-S International Microwave Biomedical Conference (IMBioC), pp.179-181, 11-13/06/2024, Montreal, Canada, DOI: 10.1109/IMBioC60287.2024.10590594
5. Torti E.; Gazzoni M.; **Marenzi E.**; Leon R.; Callicò G. M.; Danese G.; Loporati F.; "An Attention-based Parallel Algorithm for Hyperspectral Skin Cancer Classification on Low-Power GPUs", 26<sup>th</sup> Euromicro Conference on Digital System Design (DSD), 06-08/09/2023, Durazzo, Albania, DOI: 10.1109/DSD60849.2023.00025
6. Petracchi B.; Gazzoni M.; Torti E.; **Marenzi E.**; Loporati F.; "Machine Learning-based Classification of Skin Cancer Hyperspectral Images", 27<sup>th</sup> International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES 2023), 06-08/09/2023, Atene, Grecia, DOI: 10.1016/j.procs.2023.10.278
7. La Salvia M.; Torti E.; Gazzoni M.; **Marenzi E.**; Leon R.; Ortega S.; Fabelo H.; Callicò G. M.; Loporati F.; "AI-based segmentation of intraoperative glioblastoma hyperspectral images", SPIE Photonex, Vol. 12338, 06-08/12/2022, Birmingham, UK, DOI: 10.1117/12.2646782
8. La Salvia M.; Torti E.; Gazzoni M.; **Marenzi E.**; Leon R.; Ortega S.; Fabelo H.; Marrero Callicò G.; Loporati F.; "Attention-based Skin Cancer Classification Through Hyperspectral Imaging", 2022 25<sup>th</sup> Euromicro Conference on Digital System Design (DSD), pp. 871-876, 31/08/2022-02/09/2022, Maspalomas, Spagna, DOI: 10.1109/DSD57027.2022.00122
9. **Marenzi E.**; Torti E.; Danese G.; Loporati F.; "FPGA High Level Synthesis for the classification of skin tumors with hyperspectral images", 2022 11<sup>th</sup> Mediterranean Conference on Embedded Computing (MECO), pp. 1-4, 07-10/06/2022, Budva, Montenegro, DOI: 10.1109/MECO55406.2022.9797211
10. **Marenzi E.**; Danese G.; Gandolfi R.; "3D Printing of Microscope Slides for Visually Impaired University Students", 2018 IEEE Global Engineering Education Conference (EDUCON), pp. 1497-1503, 17-20/04/2018, Santa Cruz de Tenerife, Spagna, DOI: 10.1109/EDUCON.2018.8363410
11. **Marenzi E.**; Carrus A.; Danese G.; Marrero Callicò G.; Loporati F.; "Efficient Parallelization of Motion Estimation for Super-Resolution", 25<sup>th</sup> Euromicro International Conference on Parallel, Distributed and Network-based Processing, PDP, 6-8/03/2017, San Pietroburgo, Russia, DOI: 10.1109/PDP.2017.64
12. **Marenzi E.**; Bertolotti G.M.; Danese G.; "In-chair movements of healthy people during prolonged sitting", International Conference on Physiological Computing Systems (PhyCS), 7-9/01/2014, Lisbona, Portogallo, DOI: 10.5220/0004723101450152
13. **Marenzi E.**; Bertolotti G.M.; Loporati F.; Danese G.; "Capacitive sensors matrix for interface pressure measurement in clinical, ergonomic and automotive environments", 16<sup>th</sup> Euromicro Conference on Digital System Design (DSD), 4-6/09/2013, Santander, Spagna, DOI: 10.1109/DSD.2013.123
14. **Marenzi E.**; Bertolotti G.M.; Cristiani A.; De Donno F.; Loporati F.; Danese G.; Bejor M.; "Identification and evaluation of parameters for the prevention of pressure ulcers in hospitalized patients", IEEE EUROCON 2013, 1-4/07/2013, Zagabria, Croazia, DOI: 10.1109/EUROCON.2013.6625190
15. **Marenzi E.**; Lombardi R.; Bertolotti G.M.; Cristiani A.; Cabras B.; "Design and development of a novel capacitive sensor matrix for measuring pressure distribution", IEEE Sensors Applications Symposium (SAS), pp. 249-254, 7-9/02/2012, Brescia, Italia DOI: 10.1109/SAS.2012.6166282