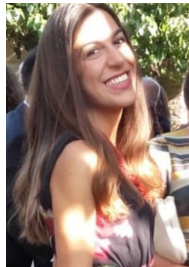


Curriculum Vitæ



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Short Bio

I graduated in Electronics Engineering from the Università Politecnica delle Marche (Italy) in 2018. Actually I am a PhD student at the Department of Electrical, Electronic, and Information Engineering (DEI), at the University of Bologna, Italy. My work focuses on the design and optimization of algorithms to optimize the performance of the parallel ULP processors for Edge Computing. My research at Embedded Energy Efficient Systems (EEES) lab focuses on analyzing performance and on benchmarking algorithms for **advanced signal processing on ultra-low power (ULP) platforms**. I am involved in the European Processor Initiative, a research project where I also serve as Dissemination Manager for the UNIBO team.

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Record of Employment

07/2019 – Present

Job position: **Research Assistant**

Affiliation: Department of Electrical, Electronic, and Information Engineering (DEI), University of Bologna, Italy.

Activity: My focus in this activity is on HW/SW co-design for Parallel Ultra-Low-Power platforms.

I address the performance improvement of software libraries such as digital signal processing, transforms, and Machine Learning algorithms. My work has been published in a Springer article, and IEEE journal.

Location: Bologna, Italy

01/2019 – 04/2019

Job position: **Technical Consultant**

Company: Alten

Activity: I was a technical consultant at Esaote S.p.A., where my work was focused on the frequency tuning on MRI machinery for specific customer's request. I developed skills on the use of the electronics instruments, in the context of the spectral analysis, SMT and power electronics.

Location: Genova, Italy

Education

- **Master's Degree in Electronics Engineering**

Institute: Università Politecnica delle Marche

Department: Department of Information Engineering (DII)

Date: 10/2018

Title of the thesis: "Effect of gender and age on muscle co-contraction during walking".

Description: This thesis was focused on the analysis of the aging and gender effects during the gait. The experimental data considered a sample set of 100 children from 6 to 11 years old. I analysed the EMG signals of the gastrocnemius and tibial muscles activities of the studied subjects. I used medical devices for signals acquisition and Matlab for the data elaboration and statistical tests such as Lilliefors, T-Student, and Wilcoxon. I also used the Origin software for the interpolation graphs analysis. This discussion can be useful for the discrimination of the physiological and pathological behaviors in children and to make a further contribution to studies about the maturation of walking.

Advisor: Prof. Francesco Di Nardo

Score: 90/110

Location: Ancona, Italy

- **Bachelor's Degree**

Institute: Università Politecnica delle Marche

Department: Department of Information Engineering (DII)

Date: 02/2012

Title of the thesis: "ECG a distanza"

Description: I studied and described the state-of-the-art, and the devices used for the ECG monitoring.

Advisor: Prof. Roberto De Leo

Score: 95/110

Location: Ancona, Italy

Research Activity

- My research at Embedded Energy Efficient Systems (EEES) lab focuses on analyzing performance and on benchmarking algorithms for advanced signal processing on ultra-low power (ULP) platforms. We published results on the efficient parallel design of STFT and DWT transforms, targeting the PULP architecture. In the last few months, I published results about the Electrocardiogram (ECG) signal processing for Heart Rate detection. Then, I implemented a parallel version of the k-Nearest-Neighbor algorithm which will be integrated into an optimized machine-learning library for ultra-low-power AI accelerators. Currently, I am preparing a publication about the ECG signals classification comparing the performance of the kNN with the Temporal Convolutional Networks.

TEACHING ACTIVITIES

- **Tutor**

Course: Architetture e Programmazione dei Sistemi Elettronici

Class: Electronics engineering

Level: Bachelor's degree

Institution: University of Bologna, Bologna, Italy

Period: 03/2021 - present

Description: I have supported the laboratory activities concerning the software development and the application debugging on the STM32 microcontroller. I have also supported students in the utilization of the IDE programming environment.

ADVANCED COURSES

- **BonsApps - Project Event**

Period: March 2022

Location: Bologna, Italy

Activity: Support to the event organization and technical aspects.

- **HiPEAC - International Conference**

Period: February 2020

Location: Bologna, Italy

Activity: I attended a workshop focused on the RISC-V architecture.

- **Introduction to Computer Architectures M**

Institution: University of Bologna, Bologna, Italy

Class: Electronics engineering

Level: Master's degree

Period: 10/2019 - 12/2019 (3 months)

Activity: I studied the main concepts about computer architectures, in particular regarding the RISC-V ISA.

- **Experis Academy**

Period: 11/2018 - 12/2018

Location: Kilometro Rosso, Bergamo, Italy

Activity: I was selected to attend an introductory course by Porini Group on data science, data analysis, and the use of cloud platform based on Microsoft Azure's Power BI.

LABORATORY EXPERIENCES

- *Period:* 2014-2016

Location: Università Politecnica delle Marche, Italy

Department: Department of Information Engineering (DII)

Description: I worked in groups on laboratory projects. We acquired skills in software tools such as Matlab, by which we implemented a model of EMG data processing and SAAM II for the analysis of glucose metabolism. Regarding Robotics, work on research and test on the Affective Computing: from bio-signals to gesture data, use of an Emotional Markup Language that uses Scherer validation test to recognize emotional states. Implementation of an IR LED using the Arduino board.

Skills

TECHNICAL SKILLS

- Very good knowledge of C and ASM programming language for embedded systems.
- Good knowledge of tools for offline algorithm analysis and design (Matlab, Python)
- Good knowledge of parallel programming paradigms.
- Good knowledge of Machine learning algorithms and frameworks.
- Good lab experience (Soldering, PCB testing, board debugging...)

LANGUAGES

- *Italian:* Mother tongue
- *English:* B2 level
- *German:* A2 level
- *French:* A2 level

CERTIFICATES

- *PET Certificate, University of Cambridge*
- *Certificate of attendance, Brighton School of English*
- *ECDL – European Computer Driving Licence*

EXPERIENCES ABROAD

- **Educational visit:** during the master thesis work, I met professors and researchers to know their research activities about my thesis topic at the KTH School of Technology and Health, in Stockholm.
- **Partnership:** cultural exchange with the students of Foreign Language High School of Munich.

SOCIAL AND MANAGEMENT SKILLS

I would highlight the growing importance of transversal competencies and soft skills such as teamwork and language and communication skills. During this work, I have had the opportunity to be in contact with many people. I believe that even in individual work, constructive dialogue and sharing are always stimulating and necessary to find solutions and new ideas. My last experiences in international projects also allowed me to improve my communication skills. One of my tasks is about the dissemination activities where my Unibo team and other European partners are involved. I focused on activities management such as the organization of tutorials and active participation in conferences and workshops.

ABOUT ME

- **Personal interests:** I have been playing and studying the piano since I was 4. I have won three editions of the Concorso Nazionale per Giovani Musicisti “Città di Camerino”. I preferred classical and jazz music but these last years I have also been part of a rock and blues band. From 2002 to 2008 I received diplomas in Solfeggio and Harmony at the Conservatory of Pesaro and Fermo and I passed the fifth year piano exam at the Conservatory of Cesena. I like to swim and athletics, with my team I participated in competitions and we won several relay races.
- **Mission:** Initiative and enthusiasm push me to go forward in the study as well as in my works. I try hard to achieve my goals, and I continue to move into new projects that allow me to grow both personally and professionally.

Honors

09/2022

Best Paper Award

Affiliation: International Conference on System-Integrated Intelligence - SysInt 2022, University of Genoa, Italy.

Description: My work focused on an optimized HW/SW co-design system based on ULP microcontroller platforms biosignal processing to detect the heart rate.

Location: Genoa, Italy

Publications

JOURNALS

[JR1] Benedetta Mazzoni, Simone Benatti, Luca Benini, and Giuseppe Tagliavini. Efficient transform algorithms for parallel ultra-low-power iot end nodes. *IEEE Embedded Systems Letters*, pages 1–1, 2021.

INTERNATIONAL CONFERENCES AND WORKSHOPS

[IC1] Benedetta Mazzoni, Giuseppe Tagliavini, Luca Benini, and Simone Benatti. An optimized heart rate detection system based on low-power microcontroller platforms for biosignal processing. In *International Conference on System-Integrated Intelligence*, pages 160–170. Springer, 2023.

Autorizzo il trattamento dei dati personali contenuti nel mio curriculum vitae in base all'art. 13 del D. Lgs. 196/2003 e all'art. 13 del Regolamento UE 2016/679 relativo alla protezione delle persone fisiche con riguardo al trattamento dei dati personali.

Date
20/02/2023

Signature