Scientific and Academic Curriculum

Andrea Galliani

Last update: February, 2024

My main interests are the study and the design of microsensors and multi-sensors embedded platforms and the way they can be connected into a bigger network.

Education

Sep 2022 - present **Engineering and Applied Science PhD** student at the University of Bergamo inserted in the Technologies for computer science, automation, electronic engineering and mechatronics curriculum

Dec 2021 **Master Degree in Computer Engineering** from the University of Bergamo

Apr 2020 **Bachelor's Degree in Computer Engineering** from the University of Bergamo

Research Activity

Jun 2022 - present **Research Fellow** at National Institute for Nuclear Physics, section of Pavia

I work to the Falaphel project. My professional duties are the design, test and characterisation of front-end circuits in a 28 nm CMOS technology for next generation High Energy Physics pixel detectors.

Collaborations

Nov 2022 - Apr 2023 Member of the team winner of the "Bosch Sensortec Making Sensor Tec! Challenge" with the project "Exhaust gas pattern analysis for environmental monitoring and predictive maintenance"

Nov 2022 - Jan 2023 "Implementation of algorithms in Gas Meter firmware" under the BELLFIOR22 research contract - responsible for the project prof. Andrea Belleri

Jan 2022 - present Web developer and software architect to the MangroviaIoT platform - responsible for the project Sorint.tek

Jun 2020 - Jan 2022 Front-end web developer for Sorint.lab internal projects

Academic Activity

My academic activity currently concerns being tutor and teacher assistant to Bachelor's and Master Engineering courses:

Academic Year 2021-present

- Tutor for the Course: Sensing Devices Lab (3 cfu)
- Tutor for the Course: Strumentazione Elettronica (6 cfu)
- Tutor for the Course: Elettronica e elaborazione segnali biomedici (6 cfu)
- Tutor for the Course: Laboratorio di Elettronica (3 cfu)

Communication at scientific conferences

2023 **EUROCON** "A zero dead-time front-end channel in 28 nm CMOS for futer high energy physics detectors", Oral session, IEEE EUROCON 2023, 6-8 July, Torino, Italy.

MOCAST "DAQ system for the readout of a flash-AD based front-end channel matrix", Poster session, International Conference on Modern Circuits and Systems Technologies (MOCAST) on Electronics and Communications, 28-30 June, Athens, Greece.

ApplePies "Acquisition System for a 28 nm flash-ADC based programmable front end channel for HEP experiments", Oral session, International Conference on Applications in Electronics Pervading Industry, Environment and Society (ApplePies), 2023, 28-29 September, Genova

Lectures Attendee

2023 **SIE PhD School** "The 2023 PhD School in Electronics aims at providing an in-depth discussion of the role of Electronics as an enabling and pervasive discipline. Professionals and researchers with industrial and academic backgrounds will also provide non-trivial examples of the transformative effect that dedicated and innovative design approaches, as well as advances in materials and devices, have had, and are expected to have, in the most promising and advanced innovation fields.", 2023 Sep 4-6, Messina, Italy.

EURIZON Detector School "The EURIZON Detector School is organized for training young scientists on state-of-the-art particle detection technologies in the fields of particle-, heavy-ion- and neutron-physics. The main program of the school comprises morning lectures by world experts in their fields, and hands-on exercises on various technologies in the afternoons.", 2023 Jul 17–28, Wuppertal. Germany,

28nm Mixed-Signal Design Workshop "Analog, Digital and Mixed-Signal design workshop in 28nm", 2023 Mar 6-10, Geneve, Switzerland.

2022 **Operational Amplifiers: Theory and Design** "Theory and design of operational amplifiers; Discusses low-voltage rail-to-rail input and output stages for design of low-power OpAmps; Presents frequency

compensation techniques for all nine OpAmp configurations and compensation techniques for amplifiers with high capacitive loads; Includes design of µV-offset operational amplifiers and precision instrumentation amplifiers by applying chopping , auto-zeroing, and dynamic element-matching techniques", 2022 Nov 7 - 19, MEAD Course, J.F. Witte, S. Javvaji, R. Hogervorst, J.H. Huisjing, R.G.H. Eschauzier, K.J. de Langen, Q. Fan, Online class

Publications

[Gai+23a] L Gaioni et al. "Development of the Analog Front-End Circuit for the CMS Pixel Readout Chip at the HL-LHC". In: *X-ray Photon Processing Detectors: Space, Industrial, and Medical applications*. Springer, 2023, pp. 129–154.

[GGT23a] Luigi Gaioni, Andrea Galliani, and Gianluca Traversi. "A Charge Sensitive Amplifier in a 28 nm CMOS Technology for Pixel Detectors at Future Particle Colliders". In: *Electronics* 12.9 (2023), p. 2054.

[Gai+23b] Luigi Gaioni et al. "28 nm CMOS analog front-end channels for future pixel detectors". In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 1045 (2023), p. 167609.

[Gal+23] A Galliani et al. "A zero dead-time front-end channel in 28 nm CMOS for future high energy physics detectors". In: *IEEE EUROCON 2023-20th International Conference on Smart Technologies*. IEEE. 2023, pp. 128–132.

[GGT23b] Andrea Galliani, Luigi Gaioni, and Gianluca Traversi. "DAQ system for the readout of a flash-ADC based front-end channel matrix". In: *2023 12th International Conference on Modern Circuits and Systems Technologies (MOCAST)*. IEEE. 2023, pp. 1–4.

[GGT23c] Andrea Galliani, Luigi Gaioni, and Gianluca Traversi. "Data Acquisition System for a 28 nm Flash-ADC Based Programmable Front End Channel for HEP Experiments". In: *International Conference on Applications in Electronics Pervading Industry, Environment and Society*. Springer. 2023, pp. 168–174.

[Tra+23] G Traversi et al. "Perspective of a 28nm CMOS Technology for Future Vertex Tracking Applications". In: *2023 IEEE Nuclear Science Symposium, Medical Imaging Conference and International Symposium on Room-Temperature Semiconductor Detectors (NSS MIC RTSD)*. IEEE. 2023, pp. 1–1.

[TGG23] Gianluca Traversi, Luigi Gaioni, and Andrea Galliani. "From 65 nm to 28 nm CMOS: design of analog building blocks of frontend channels for pixel sensors in high-energy physics experiments". In: *e & i Elektrotechnik und Informationstechnik* (2023), pp. 1–9.