Scientific and Academic Curriculum
Andrea Galliani

Last update: July, 2025

I am a computer engineer with a strong interest in the design of CMOS Integrated Circuits, multisensors embedded platforms and the way they can be connetted into bigger networks.

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

May 2024 - present **Research Fellow** at Università degli Studi di Bergamo, Engineering and Applied Science department

- As part of the Progetti di Rilevante Interesse Nazionale (PRIN), I am working on the project dedicated to Front-end channels in a 28 nm CMOS process for Pixel detectors in future High Energy physics colliders and advanced X-ray imaging instrumentation (PiHEX).

Jun 2022 - Apr 2024 **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.

Communication at scientific conferences

2025 **iWoRiD** "Design of a Time-over-Threshold Bilinear Front-End for Photon Science Applications with High Dynamic Range in 28 nm CMOS", Poster session, iWoRiD 2025 26th International Workshop on Radiation Imaging Detectors, 6-10 July, 2025, Faculty of Informatics and Information Technology STU, Bratislava, Slovakia.

SIE "Exploring 28 nm CMOS Technology for High Dynamic Range X-ray Imaging Front-End Circuits", Poster session, SIE 2025 LVI Annual Meeting of the Italian Society of Electronics, 25-27 June, University of Naples "Parthenope", 2025, Naples, Italy.

2024 **SIE** "28 nm CMOS analog front-end electronics for future High Energy Physics colliders", Poster session, SIE 2024 LV Annual Meeting of the Italian Society of Electronics, 26-28 June, 2024, Genoa, Italy.

2023 **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

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.

Lectures Attendee

2025 **Industrial skills in Electronics and Photonics** "The 2025 SIE PhD school topic is Industrial skills in Electronics and Photonics and will cover all the aspects concerning the strategies to allow bright ideas, born in the Academia, to be protected and made available for the market.", SIE, 23-25 June, 2025, University della Campania Luigi Vanvitelli, Naples, Italy.

2024 **Electronics for Health** "The 2024 SIE Ph.D. school "Electronics for Health" aims to promote research, development, and dissemination of knowledge in microelectronics and system-level approaches in biological and medical applications. Hosted by Genova, the interdisciplinary school will showcase academic and industrial perspectives on cutting-edge healthcare systems and technologies.", SIE, 24-26 June, 2024, Genoa, Italy.

SystemVerilog for Design "The course starts by covering the core SystemVerilog language features. It then progresses to examining coding for synthesis before moving on to FSM design and parameterization.", 2023 Mar 18-21, STFC, Didcot, Oxfordshire, UK.

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

Academic Activity

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

Academic Year 2024-present

- Teaching assistant for the Course: Tecnologie e dispositivi elettronici (9 cfu)

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)

Collaborations

Mar 2023 - present Member of the interdisciplinary research team from Università degli Studi di Bergamo and the Mario Negri Institute, working on a wearable electronic device for the monitoring of arteriovenous fistulas in hemodialysis patients. I contributed to the prototyping and initial implementation of the system, which leverages acoustic sensing via embedded microphones to detect health-related variations in fistula sounds. In 2025, the project was awarded funding by Fondazione Cariplo under the *InnovaWelfare* program.

Jun - Oct 2024	I won third place prize with the Oxymeter project in the StartCup Bergamo, an entrepreneurial training program by UniBG with over 60 hours of lectures, discussions, and projects.
May 2024	Participated in the Giro-E for the MOST project as a stand representative and technician managing prototype devices on race bikes, following stages from Siena to Naples (May 9-13, 2024).
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 is Sorint.tek
Jun 2020 - Jan 2022	Front-end web developer for Sorint.lab internal projects

Memberships

- Member of the **IEEE (Institute of Electrical and Electronics Engineers)** – Student Member, with access to IEEE Spectrum and IEEE Potentials Magazine.

- Member of the **IEEE Nuclear and Plasma Sciences Society (NPSS)** – Access to Transactions on Nuclear Science, Plasma Science, and other NPSS journals.

- Member of the **IEEE Young Professionals**.

- Member of the **Italian Society of Electronics (SIE)**.

Publications

[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+23a]   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.

[Gai+23b]   Luigi 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 International Publishing Cham, 2023, pp. 129–154.

[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 Nature Switzerland Cham. 2023, pp. 168–174.

[Gal+23]   Andrea 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.

[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.

[Bot+24]   Stefano Botticini et al. "Index air quality monitoring for light and active mobility". In: *Sensors* 24.10 (2024), p. 3170.

[Gai+24a]   Luigi Gaioni et al. "28 nm front-end channels for the readout of pixel sensors in future high-rate applications". In: *Journal of Instrumentation* 19.04 (2024), p. C04001.

[Gai+24b]   Luigi Gaioni et al. "A Time-over-Threshold based analog front-end in 28 nm CMOS for pixel detectors in future colliders". In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 1069 (2024), p. 169862.

[TGG24]   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* 141.1 (2024), pp. 11–19.

[Ver+24a]   Matteo Verzeroli et al. "Advancing Sustainable Mobility: A Data Acquisition System for Light Vehicles and Active Mobility". In: *Electronics* 13.21 (2024), p. 4249.

[Ver+24b]   Matteo Verzeroli et al. "Empowering smart mobility with a component-based data acquisition system for multi-sensor readout". In: *2024 19th Conference on Ph. D Research in Microelectronics and Electronics (PRIME)*. IEEE. 2024, pp. 1–4.

[Gai+25]   L Gaioni et al. "A 28 nm CMOS front-end circuit with in-pixel flash ADC for high-rate hybrid detectors". In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* (2025), p. 170655.