



Antonio Aprile, Ph.D.

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Biography

Antonio Aprile was born in Milano, Italy in 1995. He received the Bachelor's and the Master's degree (*summa cum laude*) in Electronic Engineering from University of Pavia in 2017 and 2019, respectively. From 2019 to 2022 he was a Ph.D. candidate at the Integrated MicroSystems and Sensors (IMS²) laboratory of the Department of Electrical, Computer and Biomedical Engineering, University of Pavia, where he is currently a Postdoctoral Research Fellow. His main research interests include the design and testing of integrated smart temperature sensors, high-resolution current-sensing systems, oversampled A/D converters, infrared focal-plane-arrays (IRFPAs) and gigasample rate DACs.

Employment History




- 2023 – ...  **Postdoctoral Research Fellow**
University of Pavia, Italy.
Research interests: smart temperature sensors, high-resolution current-sensing systems, oversampled A/D converters, infrared focal-plane-arrays (IRFPAs), gigasample rate DACs.



Education

- 2019 – 2022  **Ph.D. in Microelectronics**
University of Pavia, Italy.
Thesis title: *Current-mode processing based Temperature-to-Digital Converters for MEMS applications.*
- 2017 – 2019  **Master's Degree in Electronic Engineering**
University of Pavia, Italy.
Thesis title: *Design of a highly linear and low power integrated temperature sensor in CMOS technology.*
- 2014 – 2017  **Bachelor Degree in Electronic and Computer Engineering**
University of Pavia, Italy.
Thesis title: *Experimental characterization of phase change memory programming.*









Research Publications

Journal Articles




- 1 **A. Aprile**, M. Folz, D. Gardino, P. Malcovati, and E. Bonizzoni, "A bjt-based 0.08-mm² oversampling sar temperature-to-digital converter for thermal drift compensation in mems inertial sensors," *IEEE Transactions on Instrumentation and Measurement*, vol. 73, pp. 1–11, 2024.  DOI: 10.1109/TIM.2024.3366572.
- 2 **A. Aprile**, M. Folz, D. Gardino, P. Malcovati, and E. Bonizzoni, "An Area-Efficient Smart Temperature Sensor Based on a Fully Current Processing Error-Feedback Noise-Shaping SAR ADC in 180-nm CMOS," *IEEE Journal of Solid-State Circuits*, pp. 1–12, 2023.  DOI: 10.1109/JSSC.2023.3342937.
- 3 A. Gemelli, M. Tambussi, S. Fusetto, **A. Aprile**, E. Moisello, E. Bonizzoni, and P. Malcovati, "Recent Trends in Structures and Interfaces of MEMS Transducers for Audio Applications: A Review," *Micromachines*, vol. 14, no. 4, 2023.  DOI: 10.3390/mi14040847.

- 4 S. Fusetto, **A. Aprile**, P. Malcovati, and E. Bonizzoni, “Readout IC Architectures and Strategies for Un-cooled Micro-Bolometers Infrared Focal Plane Arrays: A Review,” *Sensors*, vol. 23, no. 5, 2023.  DOI: 10.3390/s23052727.
- 5 **A. Aprile**, E. Bonizzoni, and P. Malcovati, “Temperature-to-Digital Converters’ Evolution, Trends and Techniques across the Last Two Decades: A Review,” *Micromachines*, vol. 13, no. 11, 2022.  DOI: 10.3390/mi13112025.


Conference Proceedings

- 1 J. S. Yarragunta, **A. Aprile**, A. Fugger, F. Conzatti, E. Bonizzoni, and P. Malcovati, “Thermal Noise Analysis of Accumulation-based S/H Circuit for Shunt Current Sensing,” in *IEEE International Conference on Electronics, Circuits and Systems (ICECS)*, Istanbul, Turkey, 2023, pp. 1–4.  DOI: 10.1109/ICECS58634.2023.10382882.
- 2 J. S. Yarragunta, **A. Aprile**, A. Fugger, F. Conzatti, E. Bonizzoni, and P. Malcovati, “A SAR-assisted Incremental $\Sigma\Delta$ ADC with Accumulation-based S/H Circuit for Shunt Current Measurements,” in *IEEE International Symposium on Circuits and Systems (ISCAS)*, Monterey, CA, USA, 2023, pp. 1–4.  DOI: 10.1109/ISCAS46773.2023.10181913.
- 3 **A. Aprile**, M. Folz, D. Gardino, P. Malcovati, and E. Bonizzoni, “A 0.06-mm² Current-Mode Noise-Shaping SAR based Temperature-to-Digital Converter with a 4.9-nJ Energy/Conversion,” in *IEEE Custom Integrated Circuits Conference (CICC)*, San Antonio, TX, USA, 2023, pp. 1–2.  DOI: 10.1109/CICC57935.2023.10121267.
- 4 **A. Aprile**, E. Moisello, E. Bonizzoni, and P. Malcovati, “Performance Comparison of BJT and MOS Devices as Temperature Sensing Elements,” in *IEEE International Conference on Electronics, Circuits and Systems (ICECS)*, Glasgow, UK, 2022, pp. 1–4.  DOI: 10.1109/ICECS202256217.2022.9970964.
- 5 **A. Aprile**, M. Folz, D. Gardino, P. Malcovati, and E. Bonizzoni, “A Compact 2.5-nJ Energy/Conversion NPN-Based Temperature-to-Digital Converter with a Fully Current-Mode Processing Architecture,” in *IEEE European Solid State Circuits Conference (ESSCIRC)*, Milan, Italy, 2022, pp. 473–476.  DOI: 10.1109/ESSCIRC55480.2022.9911424.
- 6 **A. Aprile**, M. Folz, D. Gardino, P. Malcovati, and E. Bonizzoni, “A One-Point Exponential Trimming Technique for an Effective Suppression of Process Spread in BJT-based Temperature Processing Circuits,” in *IEEE International Symposium on Circuits and Systems (ISCAS)*, Austin, TX, USA, 2022, pp. 881–884.  DOI: 10.1109/ISCAS48785.2022.9937631.
- 7 **A. Aprile**, E. Moisello, E. Bonizzoni, and P. Malcovati, “An Extensive Investigation and Analysis of Temperature-to-Digital Converter FoMs,” in *IEEE International Conference on Electronics, Circuits, and Systems (ICECS)*, Dubai, United Arab Emirates, 2021, pp. 1–4.  DOI: 10.1109/ICECS53924.2021.9665502.
- 8 **A. Aprile**, D. Gardino, P. Malcovati, and E. Bonizzoni, “Linearity Boosting Technique Analysis for a Modified Current-Mode Bandgap Reference,” in *IEEE International Conference on Electronics, Circuits and Systems (ICECS)*, Glasgow, UK, 2020, pp. 1–4.  DOI: 10.1109/ICECS49266.2020.9294909.





Languages

- Italian  Native.
- Dutch  Native.
- English  Strong reading, writing and speaking competencies.

Skills

- Coding  C, MATLAB, LabVIEW, \LaTeX , Verilog-A, PHP.




Skills (continued)

- Computer Aided Design  Cadence, Autodesk Eagle.
- Hardware  Computer, analog/digital oscilloscope, functions generator, digital multimeter, spectrum analyzer, logic analyzer, climatic chamber, PCB soldering.
- Software  Windows, Linux, macOS, Microsoft 365, Adobe Acrobat, Adobe Illustrator.
- Misc.  Academic research, teaching, \LaTeX typesetting and publishing, event organization, music.



International Scientific Activity

- 2023  Reviewer for IEEE Transactions on Circuits and Systems I – Regular Papers, IEEE Transactions on Circuits and Systems II – Express Briefs, IEEE Sensors Journal, IEEE ISCAS Conference, IEEE NEWCAS Conference, IEEE PRIME Conference, IEEE MWSCAS Conference, IEEE ICECS Conference.
-  Guest Editor of the Special Section on the APCCAS 2023 (IEEE Transactions on Circuits and Systems II – Express Briefs).
-  “Data Converters II” Session Chair at the 2023 IEEE PRIME Conference.
-  Member of the Technical Program Committee of the 2023 IEEE PRIME Conference.
-  Guest Editor of the Special Issue on the ISICAS 2023 (IEEE Transactions on Circuits and Systems II – Express Briefs).
-  Responsible of the PCTO project “Experimental characterization of smart temperature sensors” (2022ING21) at University of Pavia.
-  Member of the Organizing Committee of the 2023 IEEE PRIME Conference (Publicity Chair).
- 2022  Reviewer for IEEE Transactions on Circuits and Systems II – Express Briefs, IEEE ISCAS Conference, IEEE PRIME Conference, IEEE ICECS Conference.
-  “Analog Integrated Circuits” Session Chair at the 2022 IEEE ICECS Conference.
-  “Challenges and Requirements in Sensory Circuit Design” Session Chair at the 2022 IEEE ICECS Conference.
-  Co-organizer of the Special Session on “Challenges and Requirements in Sensory Circuit Design” at the 2022 IEEE ICECS Conference.
-  “Human Monitoring and Detection Systems” Session Chair at the 2022 IEEE PRIME Conference.
-  Member of the Organizing Committee of the 2022 IEEE PRIME Conference (Publicity Chair).
- 2021  Reviewer for IEEE Transactions on Circuits and Systems II – Express Briefs, IEEE ISCAS Conference, IEEE ICECS Conference.

Teaching Activity

- 2020 – 2021  Tutor of the “Advanced Mathematical Methods for Engineers” course at University of Pavia.
- 2019 – 2022  Tutor of the “Electrical Linear Circuits” course at University of Pavia.
- 2018 – 2022  Tutor of the “Electronics I” course at University of Pavia.

Mentoring Activity

- Master’s Theses  Nishan Chettri, “Design of a High-Performance Current-mode ADC for Photoplethysmography Applications”
- Doctoral Theses  Abhishek Joarder, “Design of Fully GaN-based Analog Integrated Circuits”

Mentoring Activity (continued)

- 📖 Jaya Satyanarayana Yarragunta, “Smart Shunt Current Measurement Systems for Automotive Applications”

Memberships

- 2024 – ···
 - 📖 Solid-State Circuits Society (SSCS) Member.
 - 📖 Circuits and Systems Society (CASS) Member.
 - 📖 Institute of Electrical and Electronics Engineers (IEEE) Member.
- 2021 – 2023
 - 📖 Circuits and Systems Society (CASS) Student Member.
 - 📖 Institute of Electrical and Electronics Engineers (IEEE) Student Member.