



**Loukas Petrou**  
BSc, MSc, DIC, PhD, MIEEE

## Personal Info

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22 September 1992



## Memberships

- IEEE Member
- IEEE CAS Member
- ETEK Member (Cyprus Scientific and Technical Chamber)

## Certificates

- Analogue IC Design Training from Europractice
- Analogue Mixed-Signal Design Training from Europractice
- Digital IC Design Training from Europractice
- Digital Mixed-Signal Design Training from Europractice
- Digital Badges for IC / PCB Design Courses from Cadence
- Summer School on Tunable and Software-Driven Functional Metasurfaces at Aalto University
- Fire extinguisher and evacuation training
- Laser equipment usage training

## EDUCATION

- 2018 – 2023 **Doctor of Philosophy (PhD) in Electrical Engineering**  
Department of Electrical and Computer Engineering,  
University of Cyprus (UCY)  
Thesis Title: Asynchronous Chiplets for Reconfigurable Metasurfaces  
Supervisor: Professor Julius Georgiou
- 2016 – 2017 **Master of Science (MSc) in Analogue and Digital Integrated Circuit Design**  
Department of Electrical and Electronic Engineering,  
Imperial College London  
Thesis Title: Exploiting 65 nm CMOS for Advanced ISFET Sensing Arrays  
Supervisor: Professor Pantelis Georgiou
- 2012 – 2016 **Bachelor of Science (BSc) in Electrical Engineering**  
Department of Electrical and Computer Engineering,  
University of Cyprus (UCY)  
Thesis Title: Design of Hodgkin-Huxley Analog Circuit Components  
Supervisor: Professor Julius Georgiou

## RESEARCH AND TEACHING INTERESTS

### Research Interests

My current research interests (2023) are the implementation of electronic and/or microelectronic systems to enable or enhance emerging technologies, mainly (but not only) in the field of communication.

- Circuits and systems for:
  - Adaptive metamaterials
  - Reconfigurable intelligent surfaces (RIS)
  - ICT applications
  - Sensors and biomedical applications
- Asynchronous circuit design
- Low-power, low-latency mixed-signal integrated circuits
- Future emerging technologies
- RF IC design for communication systems

### Teaching Interests

My teaching interests cover the fundamental knowledge and skills required for microelectronics, as well as advanced devices and circuit techniques.

- Full-custom integrated circuit design
- Analogue integrated circuits and systems
- Advanced analogue and digital system design
- Advanced electronic devices
- Analogue signal processing
- High performance circuits and systems
- Asynchronous circuit design
- Digital circuits and logic
- Electrical circuits and networks
- Instrumentation
- Electronics and/or microelectronics laboratory
- RF IC design

- Summer School on Asynchronous Circuit Design from Yale University (online)

### Invited

- Invited presenter at the 18<sup>th</sup> International Conference on PhD Research in Microelectronics and Electronics (PRIME), 21 June 2023, Valencia, Spain

### Achievements and Interests

- 2015: Participated in the UROP program of the University of Cyprus
- 2010: Awarded the position of Officer of Communications from Cyprus Ministry of Defence
- 2009: Participated in the Summer School of Science and Computer Engineering at the University of Cyprus
- 2008: Awarded with black belt / 1 Dan in Shaolin Kung Fu
- 2006 – 2009: Various certificates of attendance in football tournaments with local football club
- 2003 – 2006: Certificates of participation in national mathematical Olympiad

### Languages – Fluent

- Greek
- English

## EMPLOYMENT

### Sep 2017 – Present: Special Scientist, University of Cyprus

Working at the University of Cyprus in parallel to my PhD, gave me the opportunity to engage in depth with the following activities, which are outside of the responsibilities of a PhD student:

- **Researcher for the following projects:**
  - **Sep 2017 – Jun 2020:** “Visorsurf – A Hardware Platform for Software-driven Functional Metasurfaces”, €5,000,000, *H2020-FETOPEN-1-2016-2017*
  - **Apr 18 – Apr 20:** “HSAadapt-JG – Real-time Control of the Wireless Behavior of Environments with Hypersurfaces”, €55,000, *RPF Complementary/0916/0008*
  - **Jan 19 – Jan 23:** “Advanced RF Electronics Center for Adaptive Metamaterials (RF-META)”, €1,000,000, *RPF Infrastructure Grant*
  - **Feb 23 – Jan 25:** “Chip-Enabled Adaptive Metasurfaces for ICT Systems”, €594,000, *Cyprus Research and Innovation Foundation (CO-DEVELOP-ICT-HEALTH)*
- **Teacher for core ECE modules at UCY**
  - ECE 305 (2021) – Electronic devices and Circuits II: This module is for 3<sup>rd</sup> year students and looks at secondary effects in MOS devices, single stage amplifiers, differential amplifiers, current mirrors, frequency response, noise, feedback, op-amp design, stability and compensation, and reference circuits.
  - ECE 306 (2022) – Electronics circuits laboratory: This module is for 3<sup>rd</sup> year students, where they get a hands-on experience with analogue integrated circuits. They also design integrated circuits on Cadence Virtuoso using a commercially available PDK (TSMC 0.18 um).
- **Teaching assistant for core ECE modules at UCY**
  - ECE 305 (2023) – Electronic devices and Circuits II
  - ECE 306 (2017-2021) – Electronics circuits laboratory
- **Proposal writing**
  - Successful proposal (under the supervision of my professor) for continuation of my PhD research – “Chip-Enabled Adaptive Metasurfaces for ICT Systems”, *Cyprus Research and Innovation Foundation (CO-DEVELOP-ICT-HEALTH)*, €360,000 of €594,000.
  - Engaged in EU proposals as partner and delivered the contribution required from our laboratory (on-going).
  - Engaged in infrastructure proposal for a state-of-the-art microelectronics centre in Cyprus (on-going).
- **Technical committee co-chair for conference (on-going)**
  - PRIME 2024
- **Review scientific papers for IEEE**
- **Seminars/Talks**
  - UCY ECE Seminar Series, 25/11/20: Asynchronous Digital ASIC Design for the Realization of Scalable and Programmable Metamaterials

- EMPHASIS Launch Event, 25/11/20: Integrated Circuits for RF Metasurfaces
- UCY ECE Seminar Series, 15/03/23: ASICs for Adaptive Metasurfaces
- Co-supervise final year students
- Key researcher on EU project
  - Manage Consortium Meetings
  - Meeting strict deadlines
  - Presentations, Technical Discussions and Key Decisions
  - Made significant contribution to the field

## TECHNICAL SKILLS

<b>Circuits and Systems:</b>	Full-Custom Analogue, Digital, Mixed-Signal and Asynchronous Digital IC Design with Cadence and Synopsys tools PCB Design with Altium Designer
<b>IC assembly</b>	Analogue, Digital and mixed-signal IC verification, assembly and foundry contact for MPW or full-wafer fabrication, die cutting and packaging
<b>PCB assembly</b>	Rigid, Rigid Flex, Flexible PCB order, component order; PCB assembly/population
<b>Tests and Measurements in Laboratory</b>	IC Wire-Bonding; Pick-and-Place; Re-flow Oven; X-Ray Inspection; Probe Station; Logic analyser; Source-Measure Units; Oscilloscopes; Power supplies; Advanced Soldering/Desoldering; PCB manufacturing; BGA rework station and all basic tools and equipment of an electronics laboratory
<b>FPGA/MCU programming</b>	Xilinx Vivado and Vivado HLS ; Altera – Quartus II; Raspberry Pi; Arduino; ESP32; ARM
<b>Technology Computer Aided Design</b>	Synopsys Sentaurus TCAD for 3D technology modelling
<b>Programming</b>	Verilog; VHDL; C; C++; Basic Java
<b>Flowchart / Schematic Tools</b>	Microsoft Visio; Adobe Photoshop; Canva
<b>Video Editing</b>	Camtasia Studio; OBS Studio
<b>Math Tools / System Design</b>	MathWorks MATLAB; NI LabView
<b>Other Com. Skills</b>	ECDL (7 courses) including Microsoft Word, Excel, Power Point, Access
<b>Operating Systems</b>	Windows; Linux/Unix

## PUBLICATIONS

### Journal Articles

1. L. Petrou and J. Georgiou, "An ASIC Architecture With Inter-Chip Networking for Individual Control of Adaptive-Metamaterial Cells," in *IEEE Access*, vol. 10, pp. 80234-80248, 2022.
2. L. Petrou, K. M. Kossifos, M. A. Antoniadis and J. Georgiou, "A Programmable Complex Impedance IC for Scalable and Reconfigurable Meta-Atoms," in *IEEE Transactions on Nanotechnology*, vol. 21, pp. 692-702, 2022.

3. **Petrou, L.**, Kossifos, K.M., Antoniadis, M.A. and Georgiou J., "The first family of application-specific integrated circuits for programmable and reconfigurable metasurfaces" *Sci Rep* 12, 5826 (2022).
4. Kossifos, K.M., **Petrou, L.**, Varnava, G., Pitilakis, A., Tsilipakos, O., Liu, F., Karousios, P., Tasolamprou, A.C., Seckel, M., Manessis, D., Kantartzis, N.V., Kwon, D., Antoniadis, M.A. and Georgiou, J. "Toward the Realization of a Programmable Metasurface Absorber Enabled by Custom Integrated Circuit Technology," in *IEEE Access*, vol. 8, pp. 92986-92998, 2020.
5. Dimitrios Kouzapas, Constantinos Skitsas, Taqwa Saeed, Vassos Soteriou, Marios Lestas, Anna Philippou, Sergi Abadal, Christos Liaskos, **Loukas Petrou**, Julius Georgiou, Andreas Pitsillides, "Towards fault adaptive routing in metasurface controller networks", *Journal of Systems Architecture*, Volume 106, 2020, 101703.

#### Conference Papers & Workshops

1. **L. Petrou**, P. Karousios and J. Georgiou, "Asynchronous Circuits as an Enabler of Scalable and Programmable Metasurfaces," *2018 IEEE International Symposium on Circuits and Systems (ISCAS)*, Florence, Italy, 2018, pp. 1-5.
2. Kouvaros, P., Kouzapas, D., Philippou, A., Georgiou, J., **Petrou, L.**, Pitsillides, A. (2018), "Formal Verification of a Programmable Hypersurface", Howar, F., Barnat, J. *Formal Methods for Industrial Critical Systems. FMICS 2018*. Lecture Notes in Computer Science(), vol 11119. Springer, Cham.
3. Saeed, T., Skitsas, C., Kouzapas, D., Lestas, M., Soteriou, V., Philippou, A., Abadal, S., Liaskos, C., **Petrou, L.**, Georgiou, J. and Pitsillides, A., "Fault Adaptive Routing in Metasurface Controller Networks," *2018 11th International Workshop on Network on Chip Architectures (NoCArc)*, Fukuoka, Japan, 2018, pp. 1-6.
4. N. Moser, **L. Petrou**, Y. Hu and P. Georgiou, "An ISFET Pixel with Integrated Trapped Charge Compensation using Temperature Feedback," *2018 IEEE International Symposium on Circuits and Systems (ISCAS)*, Florence, Italy, 2018, pp. 1-5.
5. **L. Petrou**, M.A. Antoniadis, and J. Georgiou, "Dynamic Control of Reconfigurable Intelligent Surfaces: An IC-Based MOS Varactor Approach", *2024 IEEE International Symposium on Circuits and Systems (ISCAS)*, (Submitted).