Curriculum Vitae of Dr. Ioannis Vourkas

Profile Summary

Dr. Ioannis Vourkas was born in Kozani, Greece, in 1985. He received the M. Eng. (Diploma) and the Ph.D. degrees in Electrical and Computer Eng. (ECE) from the Democritus University of Thrace (DUTh), Greece, in 2008 and 2014, respectively. In 2015 joined the Pontifical Catholic University of Chile (PUC) as a postdoctoral researcher. Between 2017 – 2024 he was with the Dept. of Electronic Eng. of Universidad Técnica Federico Santa María (UTFSM) in Valparaíso, Chile, and had an associate researcher appointment with the AC3E Research Center of UTFSM. Currently he is Associate Professor with Tenure in the Dept. of Electrical and Computer Eng. (ECE) of the Democritus University of Thrace (DUTh) in Greece. Also, in early 2019 he was visiting researcher in the Dept. of Electronic Eng. of Polytechnic University of Catalonia – (UPC) for 2 months.

In 2006 he received an annual performance award from the Greek State Scholarships Foundation (IKY), rated first among all course students in the third year of studies. In his Ph.D. he focused on the design and simulation of nanoelectronic circuits and systems based on resistive-switching devices (ReRAM devices or memristors). He was *runner-up* for the best Thesis award in the Ph.D. Forum of VLSI-SoC 2013 in Istanbul, Turkey, on 7-9 Oct. 2013. In 2015 he received the *best Ph.D. student award* from the ECE department of DUTh.

He was *Tutorial speaker* in ICECS 2015 in Cairo, Egypt, on 6-9 Dec. 2015, in LASCAS 2017 in Bariloche, Argentina, on 20-23 Feb. 2017, and in MOCAST 2019 in Thessaloniki, Greece, on 13-15 May 2019. He was *Invited speaker* in the 2017 Seiden Frontiers in Science Workshop in Haifa, Israel, on 05-06 Jun. 2017, in ChileCON 2017 in Pucón, Chile, on 18-20 Oct. 2017, in the 11th and 12th IC Design Bootcamp of Synopsys R&D in Chile held in 2021 and 2023, respectively, and *Trainer* in the 3rd COST MemoCIS Training School, in Haifa, Israel, on 07-09 Jun. 2017.

His current research focuses on ReRAM characterization, modeling, and simulation, and on novel circuits and architectures for ReRAM-centric computing. His research interests include unconventional and in-memory computing, as well as software and hardware aspects of parallel bio-inspired (neuromorphic) computational circuits and systems. He is the main author of one book, three book chapters, of more than 30 international journal articles and more than 55 papers included in peer-reviewed conference proceedings. His research has been funded by the Chilean National Agency for Research and Development (ANID) and Synopsys R&D in Chile. His research impact was recognized by Knowm Inc. and his proposed instrumentation solutions were considered by the industrial sector.

He has been with the Organizing Committees of ACRI 2012, in Santorini, Greece, the IEEE/ACM NanoArch 2018 in Athens, Greece, the LASCAS 2022 in Santiago, Chile, the CNNA 2023 and IEEE CAFE 2024, both held in Xanthi Greece. He is IEEE CASS and NanoGiga TC member, and serves in the Editorial Board of IEEE Trans. on Nanotechnology (since 2021) and Elsevier Microelectronics Journal (since 2017). He has been a scholar of the Greek *BODOSSAKI Foundation* (2011 to 2014) and of the *Santander Universities Program* (2018/2019).

Personal information

Name	:	Ioannis	**Surname**	:	Vourkas	**Father´s name**	: Panagiotis
Gender	:	Male					
Date of birth	:	November 7, 1985			**Greek ID (Α.Δ.Τ.)**	:	N/A
Country of origin	:	Greece			**Greek VAT (Α.Φ.Μ.)**	:	N/A
Nationality	:	Greek			**Chilean VAT (R.U.N.)**	:	N/A
Marital status	:	Married without children					
Military service	:	Completed in 2010					
Hobbies	:	Reading, Cooking, traveling, sightseeing					

Contact Information

Home address	:	N/A
Work address	:	Democritus University of Thrace, Dept. of Electrical & Computer Engineering, Panepistimioupoli, Kimmeria, Build. B, Off. 1.20, P.C. 67100, Xanthi, Greece
Cell phone	:	N/A **Office phone** : N/A
Email	:	N/A
Institutional URL	:	N/A
LinkedIn URL	:	www.linkedin.com/in/ioannis-vourkas
Skype contact (ID)	:	Ioannis Vourkas (jovourk)
ORCID ID	:	0000-0002-7036-8092
Scopus Author ID	:	https://www.scopus.com/authid/detail.uri?authorId=35173992700
Google Scholar ID	:	http://scholar.google.gr/citations?user=5gyHl_kAAAAJ&hl=en

Education

12/2014:	I received the Ph.D. degree from the Dept. of Electrical & Computer Eng. of the Democritus University of Thrace (DUTh), Xanthi, Greece, with overall grade 9.38/10 (Excellent).
11/2014:	I defended the Ph.D. dissertation before the examination committee.
11/2010:	I joined the Dept. of Electrical & Computer Eng. of the Democritus University of Thrace (DUTh), Xanthi, Greece, as a Ph.D. student. Ph.D. Thesis title: "*Design and development of nanoelectronic circuits and architectures*". Supervisor: Professor Georgios Ch. Sirakoulis.
11/2008:	I received the M. Eng. (Diploma) degree from the Dept. of Electrical & Computer Eng. of the Democritus University of Thrace (DUTh), Xanthi, Greece, with overall grade 8.11/10 (Very Good). Diploma Thesis title: "*Development of a data assignment methodology for applications implemented in Network-on-Chip (NoC) architectures*". Supervisor: Professor Georgios Ch. Sirakoulis.
10/2003:	I entered the Department of Electrical & Computer Engineering of the Democritus University of Thrace (DUTh), Xanthi, Greece, through national exams.
06/2003:	I graduated from the 3rd High School of Kozani, Greece, with overall grade: 18.9/20 (Excellent).

Achievements (Invited talks, Honors and Awards)

04/2024:	*Invited speaker* in the 15th Electrical and Computer Engineering Student Conference (ECESCON or ΣΦΗΜΜΥ) in Xanthi, Greece, on 19-21 Apr. 2024 (DUTh Kimmeria Campus)
06/2023:	*Invited speaker* in the 1st CAD & Nanoelectronics Seminar (CANELOS) in Chile on 29-30 June 2023 (UTFSM Central Campus, Valparaiso)
01/2023:	*Invited speaker* in the 12th Integrated Circuit Design Bootcamp of Synopsys R&D in Chile on 09-13 Jan. 2023 (UTFSM Central Campus, Valparaiso)

07/2021: Our paper in the IEEE MOCAST 2021 held in Thessaloniki, Greece, was nominated for the *Best Paper Award* & *Best Student Paper Award* (see publication list).

04/2021: *Invited speaker* in the Spring Colloquium Series of the ECE Department of Technical University of Crete (TUC) in Greece, on 16 Apr. 2021 (virtual event)

02/2021: *Invited speaker* in the 11th Integrated Circuit Design Summer School of Synopsys R&D in Chile on 01-12 Feb. 2021 (virtual event)

08/2019 *Invited speaker* in the 1st Joint Conference of AC3E & CINV Research Centers in Valparaíso, Chile, on 22 Aug. 2019 (UTFSM Central Campus, Valparaiso)

05/2019: *Tutorial speaker* in the 2019 Int. Conference on Modern Circuits & Systems Technologies (MOCAST), held in Thessaloniki, Greece, on May 13-15, 2019

05/2018: Won an ***Iberoamerica Santander Universities Research Scholarship*** for a 2-month research stay in the Polytechnic University of Catalonia, Barcelona Spain.

05/2018: Our paper in the IEEE MOCAST 2018 held in Thessaloniki, Greece, was nominated for the *Best Paper Award* (see publication list).

10/2017: *Invited speaker* in the 2017 IEEE Chilean Conference on Electrical, Electronics Eng. and ICT (ChileCon), held in Pucón, Chile, on Oct. 18-20, 2017

10/2017: *Invited speaker* in the 3rd Congress on Robotics and Neuroscience (CRONE), held in Valparaíso, Chile, Oct. 12-14, 2017

06/2017: *Invited speaker* in the 2017 Seiden Frontiers in Eng. and Science Workshop in Haifa, Israel, on 05-06 Jun. 2017, and *invited trainer* in the 3rd COST MemoCIS Training School, in Haifa, Israel, on 07-09 Jun. 2017

02/2017: *Tutorial speaker* in the 2017 IEEE Latin American Symp. Circuits and Syst. (LASCAS), held in Bariloche, Argentina, on Feb. 20-23, 2017

12/2015: *Tutorial speaker* in the 2015 IEEE Int. Conf. on Electronics, Circuits, and Systems (ICECS) held in Cairo, Egypt, on 6-9 Dec., 2015

10/2015: Won a ***Juan de la Cierva Formación*** **competitive research grant** from Spain, with score 92% (Early-rejected contract. Moved to Chile to join PUC.).

03/2015: Received the ***Best Ph.D. student award*** from the Department of Electrical & Computer Engineering (ECE) of the Democritus University of Thrace (DUTh).

10/2013: I was *runner-up* for the Best Ph.D. work in the Ph.D. Forum special session of the VLSI-SoC 2013 Conference, in Istanbul, Turkey, on 7-9 Oct. 2013.

09/2011–10/2014: Awarded a ***Ph.D. study scholarship from the BODOSSAKI Foundation*** in Greece, through a competitive selection process.

11/2008: Graduated from the ECE department of DUTh with overall grade 8.11/10 **rated 4th out of 116 students** who graduated.

2006: Annual ***performance award from the Greek State Scholarships Foundation (IKY)*** for completing with honors the 3rd year (2005-2006) of my undergraduate studies.

Professional experience

07/2024 – today Associate Professor, *with Tenure*, with the Dept. of Electrical & Computer Engineering of Democritus University of Thrace in Xanthi, Greece

03/2021 – 07/2024	Associate Professor, *with Tenure*, with the Dept. of Electronic Engineering of the Universidad Técnica Federico Santa María in Valparaíso, Chile
11/2018 – 07/2024	Associate Researcher with the Data Analytics & Artificial Intelligence Group of the Advanced Center of Electrical & Electronic Eng. (AC3E) in Valparaíso, Chile
08/2017 – 02/2021	Assistant Professor with the Dept. of Electronic Eng. of the Universidad Técnica Federico Santa María in Valparaíso, Chile
03/2017 – 07/2017	Adjunct Instructor (Part-time Lecturer) with the Dept. of Electrical Eng. of the Pontificia Universidad Católica de Chile (PUC) in Santiago, Chile
04/2016 – 07/2017	Affiliated Post-doctoral Researcher with the Research Center for Nanotechnology & Advanced Materials (CIEN-UC) of the Pontificia Universidad Católica de Chile (PUC) in Santiago, Chile
11/2015 – 07/2017	Post-doctoral Researcher with the Dept. of Electrical Eng. of the Pontificia Universidad Católica de Chile (PUC) in Santiago, Chile
11/2010 – 12/2014	Teaching Assistant in several undergraduate ECE class courses of DUTh.
03/2010 – 11/2010	Administration, technical support and monitoring of the local area computer network at military headquarters in Kozani, Greece, during my military service
11/2008 – 02/2009 & 09/2009 – 02/2010	In my free time, I occasionally worked in a family business in the catering sector, located in the city-center of my home-town, Kozani, in Greece
03/2009 – 08/2009	Internship at the Institute of Industrial and Control Engineering (IOC) in UPC, Spain, through the European vocational training program "*Leonardo Da Vinci*"
06/2006 – 08/2006	Summer internship at the "Cultural and Educational Technology Institute (CETI)" in Xanthi, Greece

Educational Experience

Teaching:

(10/2024 – today) **Courses taught in the Dept. of Electrical & Computer Eng. of DUTh, Greece**:

- Fall courses:
  - HxxY: Embedded Systems Design (3 teaching hrs/week + 2 lab hrs/week)
  - H19Y: Microprocessors and Applications (3 lab hrs/week)

(08/2017 – 07/2024) **Courses taught in the Dept. of Electronic Engineering of UTFSM, Chile**:

- Spring courses:
  - ELO 312: Laboratory of Microcontrollers (1.5 teaching hrs/week + 3.5 lab hrs/week)
  - ELO 321: Operating Systems (3 teaching hrs/week)
  - ELO 326: Computers Seminar –: ReRAM Device Technology & Applications (3 teaching hrs/week)

- Fall courses:
  - ELO 211: Digital Systems (3 teaching hrs/week)
  - ELO 320: Data Structures & Algorithms (3 teaching hrs/week)
  - IPD 445: Digital IC Design (**postgraduate course**, 3 teaching hrs/week)

(03/2017 - 07/2017) **Courses taught in the Dept. of Electrical Engineering of PUC, Chile**:

IEE2753: Digital IC Design (**postgraduate course**, 3 teaching hrs/week)

(2011 - 2014) **Courses taught in the Dept. of Electrical & Computer Eng. of DUTh, Greece** (**Teaching Assistant** during my Ph.D. studies):

H48Y: Design and Analysis of Complex Electronic Systems
H13Y: Digital Systems Design
H19Y: Microprocessors and Applications
H30Y: VLSI Systems I
H35E: Nanoelectronic Devices and Circuits
H07E: Quantum Computers

Student supervision:

- **Ph.D.:**

  Retired after freezing studies for 2 yrs during COVID-19 pandemic:

  Luís Sanchez — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile

- **M.Sc.:**

  Ongoing:

  Mauricio Aravena — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  Miguel Andrade — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile

  Graduated:

  (08/2024) Kevin Pizarro — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (08/2024) Benjamín Villegas — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (03/2024) Patricio Carrasco — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (03/2024) Jose Cayo — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (09/2022) Carlos Fernandez — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (07/2021) Felipe Pinto — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile

- **Undergraduate**:

  Ongoing:

  Joaquín Hevia — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile

  Graduated:

  (08/2023) Matias Melivilu — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (03/2023) Ricardo Mardones — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (11/2021) Sergio Castro — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (05/2021) Rodrigo Jimenez — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile
  (03/2021) José Cayo — Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile

Student co-supervision:

- **Ph.D.:**

  Graduated:

  (05/2020) Manuel Escudero — Dept. of Electronic Eng., UPC in Barcelona, Spain
  Supervisor: Antonio Rubio, UPC, Barcelona, Spain
  Thesis information available here

- **Undergraduate**:

  Ongoing:

  TBA

  Graduated:

(03/2024) Alejandro Fuentes	Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile Supervisor: Marcelo Perez, UTFSM, Chile
(04/2022) Francisco Romero	Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile Supervisor: Fernando Auat, UTFSM, Chile
(06/2021) Robinson De La Fuente	Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile Supervisor: Marcelo Perez, UTFSM, Chile
(12/2019) Adrián Carreño	Dept. of Electronic Eng. of UTFSM in Valparaíso, Chile Supervisor: Fernando Auat, UTFSM, Chile

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Administrative Tasks & Participation in Institutional Committees

- (01/2022 – 07/2024) Head of Computers Division, Dept. of Electronic Eng. of UTFSM, Chile
- (09/2021 – 12/2023) Coordinator of AC3E-Synopsys Chile initiative on *Digital IC Design*
- (04/2020 – 01/2024) Member of the Postgraduate Committee of the Dept. of Electronic Eng. of UTFSM, Chile representing the Computers Division
- (2021 - 2022) Member of the Self-evaluation committee for accreditation of the Ph.D. Program of Studies, Dept. of Electronic Eng. of UTFSM, Chile
- (2020 - 2021) Member of the Undergraduate Curriculum Renewal Committee for the Computers Div. in the Dept. of Electronic Eng. of UTFSM, Chile
- (2017 - 2023) Professor in charge and coordinator of ELO312 Laboratory course, Dept. of Electronic Eng. of UTFSM, Chile

Creation of University Courses:

- (2022) First time teaching of a practical course on **ReRAM Device Technology** (3 teaching hrs/week) through the ELO 326:Computers Seminar Syllabus, Dept. of Electronic Eng. of UTFSM, Chile
- (2019) Creation of the IPD445 Postgraduate Course about Digital IC Design, Dept. of Electronic Eng. of UTFSM, Chile
- (2017) Creation of the IPD439 Advanced Postgraduate Seminar Course, Dept. of Electronic Eng. of UTFSM, Chile

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Professional service activity

Editorial Board Member:

- I serve as *Associate Editor* of IEEE Transactions on Nanotechnology ever since 08/2021.
- I serve as *Associate Editor* of Elsevier Microelectronics Journal ever since 08/2017.
- I was invited *Guest Editor* in a Special Issue of the Taylor & Francis Int. Journal of Parallel, Emergent and Distributed Systems (JPEDS) about “Advances in Memristive Networks”.

Organization Committee Member:

- 2024 Financial co-chair, IEEE CAFE 2024 international conference, Greece
- 2023 Special session co-chair, IEEE CNNA 2023 international conference, Greece
- 2022 Special session co-chair, IEEE LASCAS 2022 international conference, Chile
- 2021 Publicity co-chair of IEEE MOCAST 2021 international conference, Greece
- 2018 Registration co-chair of IEEE/ACM NanoArch 2018 international conference, Greece
- 2012 Organizing Committee Assistant of ACRI 2012 international conference, Greece

Memberships of Scientific and Technical Societies:

- 2012 – now IEEE & IEEE-CASS (Member)
- 2020 – now IEEE-CASS Nanoelectronics and Gigascale Systems Technical Committee

Book proposal reviewer

- SpringerBriefs series, Springer (2016)
- CRC Press, Mathematics, Physics, and Life Sciences series, Taylor & Francis Group (2017)

Project Proposal Reviewer

- Argentinean Fund for Scientific and Technological Research (FONCyT), 2021, 2022
- USA-Israel Binational Science Foundation 2020
- Chilean ANID FONDECYT 2019 Regular category
- Chilean ANID FONDECYT 2015 Initiation into Research category
- Reviewer for internal projects submitted for institutional grants in the UTFSM

I have occasionally served as **Reviewer** in several scientific journals, including the following:

- Nature Communications
- IEEE Trans. on Nanotechnology
- IEEE Trans. on Circuits and Systems I: Regular Papers
- IEEE Trans. on Circuits and Systems II: Express Briefs
- IEEE Trans. on Neural Networks and Learning Systems
- IEEE Trans. on VLSI Systems
- IEEE Access
- ACM Journal on Emerging Technologies in Computing Systems
- Elsevier Microelectronics Journal
- Elsevier Neural Networks
- Elsevier Solid State Electronics
- Elsevier Integration, the VLSI Journal
- Elsevier International Journal of Electronics and Communications
- Wiley International Journal of Circuit Theory and Applications
- Springer Circuits, Systems, and Signal Processing
- World Scientific International Journal of Bifurcation and Chaos
- MDPI Applied Sciences
- MDPI Electronics

I have been a **program committee** member in several conferences, such as:

- IEEE Int. Symposium on Circuits and Systems (ISCAS)
- IEEE Int. Conference on Electronics, Circuits and Systems (ICECS)
- IEEE Latin American Symposium on Circuits and Systems (LASCAS)
- Design of Circuits and Integrated Systems Conference (DCIS)
- Int. Conf. on Modern Circuits and Syst. Technol. (MOCAST)
- European Conference on Circuit Theory and Design (ECCTD)

Research areas of interest

- ReRAM device characterization & modeling
- In-memory computing circuits & systems
- Memristor theory & applications
- Neuromorphic (brain-inspired) computing
- Unconventional computing
- Instrumentation solutions for ReRAM

Participation in Research Projects

A. *Chilean national funded projects*

A.5. **VARANOIC**: "*Variability-Tolerant and Noise-Induced Memristor-based Edge Computing*," **FONDECYT Regular** Nº. 1221747 Chilean government research grant. **PI**: Ioannis Vourkas. Duration: 4 years (**01/04/2022 – 31/03/2026**) Budget: 137.200.000 CLP

A.4. **VarExMeNu**: "*Variability-aware Exploration of Memristors for Neuromorphic and in-Memory Computing Applications*," **FONDECYT Iniciación** Nº. 11180706 Chilean government research grant. **PI**: Ioannis Vourkas. Duration: 3 years (**01/11/2018 – 31/10/2021**) Budget: 67.071.000 CLP

A.3. "*Memorias semiconductoras avanzadas: Bulk, FinFET, FDSOI, SRAM (6T, 8T, 10T), DRAM, eDRAM, y futuras tecnologías emergentes. Análisis de opciones, prestaciones y limitaciones*," **CONICYT PCI** 2018 Atracción de Capital Humano Avanzado del Extranjero, Modalidad de Estadías Cortas (**MEC**) Nº MEC80180089, Chilean government research grant. **Academic in charge**: Ioannis Vourkas, Visiting Professor: Antonio Rubio (Polytechnic University of Catalonia, Spain). Duration: 2 months (**01/06/2019 – 31/07/2019**) Budget: 6.600.000 CLP

A.2. "*Reservoir Computing con Redes de Memristors*," **CONICYT PCI** 2017 Apoyo a la Formación de Redes Internacionales para Investigadores(as) en Etapa Inicial Nº REDI170604, Chilean government research grant. **PI**: Ioannis Vourkas, Duration: 2 years (**01/01/2018 – 31/12/2019**) Budget: 18.000.000 CLP

A.1. **CLeArMeNu**: "*Memristive Neural Computing & Learning Architectures*," **FONDECYT Postdoctorado** Nº. 3160042 Chilean government research grant. **PI**: Ioannis Vourkas, Sponsoring researcher: Ángel Abusleme. Duration: 3 years (**01/11/2015 – 31/10/2018**) Budget: 62.532.000 CLP

B. *Other projects*

B.7. "*Desarrollo de plataforma de evaluación para dispositivos memristor*". **UTFSM Internal grant "**Proyectos Internos de Innovación y Transferencia Tecnológica USM – 2023". **Collaborating researcher**:

Ioannis Vourkas. Duration: 18 months (**18/05/2023 - 17/11/2024**) Budget: 15.000.000 CLP

B.6. "*Diseño de memorias ReRAM para arquitecturas neuroinspiradas y de computación en memoria*". **UTFSM Internal grant "**Modalidad de Estadías Cortas de Investigación (**MEC USM**) – 2022". **Academic in charge**: Ioannis Vourkas. Visiting Professor: Albert Cirera (University of Barcelona, Spain). Duration: 3 months (**03/10/2022 - 27/01/2023**) Budget: 7.500.000 CLP

B.5. **Synopsys R&D** Research Scholarship for the development of *Synthesis Tools for ReRAM-based in-Memory Computing*. **Sponsoring researcher**: Ioannis Vourkas. Scholarship recipient: MSc student Carlos Fernandez. Duration: 16 months (**01/11/2020 – 31/02/2022**) Budget: 5.000.000 CLP

B.4 VIGILANT: "*The Variability Challenge in Nanoelectronics: Mitigation and Exploitation*", «Proyectos I+D+i» Convocatoria 2019 - Modalidades «Retos Investigación» y «Generación de Conocimiento». Ministry of Science and Innovation, Government of Spain. grant No. PID2019-103869RB-C33. Participation as **External collaborator**. Duration: 3 years (**01/06/2020 – 31/05/2023**) Budget:160.000 EUR

B.3. **Iberoamerica Santander Universities** Research Scholarship for a 2-month research stay in the Polytechnic University of Catalonia, Barcelona Spain. **PI**: Ioannis Vourkas, Sponsoring Academic at the hosting Institution: Antonio Rubio. Duration: 2 months (**30/12/2018 – 04/03/2019**) Budget: 5.000 EUR

B.2. **UTFSM Internal Teaching Lab Equipment Renovation** grant. **Academic in charge**: Ioannis Vourkas. Duration: 12 months (**01/04/2022 – 31/03/2023**) Budget: 7.500.000 CLP

B.1. **UTFSM Internal Teaching Lab Equipment Renovation** grant. **Academic in charge**: Ioannis Vourkas. Duration: 12 months (**01/06/2018 – 31/05/2019**) Budget: 19.940.000 CLP

Publications

A. *Referred Journal Papers*

A.34. I. Vourkas, "Hardware Design Strategies Oriented to Edge Computing and AgriFood Electronics for Image Processing using Cellular Automata," *Parallel Processing Letters.*, *early access*, 2024

A.33. K. Pizarro, and I. Vourkas, "Design and Simulation of a Hyperdimensional Computing System with Memristive Associative Memory for Image Classification," *Int. Journ. of Unconventional Computing*, vol. 19, no. 2-3, pp. 219-244, Oct. 2024

A.32. B. Villegas, and I. Vourkas, "A Gate-Level Power Estimation Approach with a Comprehensive Definition of Thresholds for Classification and Filtering of Inertial Glitch Pulses", *MDPI Journal of Low Power Electronics and Applications*, vol. 14, no. 3 (41), Aug. 2024

A.31. J. Riquelme, and I. Vourkas, , "A Star Network of Bipolar Memristive Devices Enables Sensing and Temporal Computing", *MDPI Sensors*, vol. 24, no. 2 (512), Jan. 2024

A.30. R.-E. Karamani, I.-A. Fyrigos, V. Ntinas, I. Vourkas, A. Adamatzky, and G. Ch. Sirakoulis, "Memristors in Cellular-Automata-Based Computing: A Review", *MDPI Electronics*, vol. 12, no. 16, pp. 3523, Aug 2023

A.29. C. Fernandez, A. Cirera, and I. Vourkas, "Design Exploration of Threshold Logic in Memory and Experimental Implementation using Knowm Memristors," *Int. Journ. of Unconventional Computing*, vol. 18, no. 2-3, pp. 249-267, Jun. 2023

A.28. A. Cirera, B. Garrido, A. Rubio, and I. Vourkas, "Effective Current-Driven Memory Operations for Low-Power ReRAM Applications", *IEEE Access*, vol. 11, pp. 51260 – 51269, May, 2023

A.27. F. Pinto, and I. Vourkas, "Robust Circuit and System Design for General-Purpose Computational Resistive Memories", *MDPI Electronics*, vol. 10, no. 9, pp. 1074, May 2021

A.26. M. Escudero, I. Vourkas, and A. Rubio, "Alternative Memristor-based Interconnect Topologies for Fast Adaptive Synchronization of Chaotic Circuits", *Elsevier Chaos, Solitons & Fractals.*, vol. 138, no. 109974, Sept. 2020

A.25. C. Fernandez, J. Gomez, J. Ortiz, and I. Vourkas, "Comprehensive Predictive Modeling of Resistive Switching Devices using a Bias-dependent Window Function Approach", *Elsevier Solid State Electronics*, vol. 170, no. 107833, Aug. 2020

A.24. J. Gomez, I. Vourkas, A. Abusleme, G. Ch. Sirakoulis, and A. Rubio, "Voltage Divider for Self-Limited Analog State Programing of Memristors", *IEEE Trans. Circ. Syst. II: Exp. Briefs*, vol. 67, no. 4, pp. 620 – 624, Apr. 2020

A.23. C. Fernandez, I. Vourkas, and A. Rubio "Shortest Path Computing in Directed Graphs with Weighted Edges Mapped on Random Networks of Memristors", *Parallel Processing Letters.*, vol. 30, no. 1, pp. 2050002, Mar. 2020

A.22. J. Gomez, I. Vourkas, A. Abusleme, R. Rodríguez, J. Martin-Martinez, M. Nafria, and A. Rubio, "Exploring the "Resistance Change per Energy Unit" as Universal Performance Parameter for Resistive Switching Devices", *Elsevier Solid State Electronics.*, vol. 165, no. 107748, Mar. 2020 (**special mention by *Knowm Inc*. in early 2020**)

A.21. M. Escudero, I. Vourkas, A. Rubio, and F. Moll, "Memristive Logic in Crossbar Memory Arrays: Variability-Aware Design for Higher Reliability", *IEEE Trans. Nanotechnol*., vol. 18, pp. 635 – 646, Jun. 2019

A.20. J. Gomez, I. Vourkas, and A. Abusleme, "Exploring Memristor Multi-Level Tuning Dependencies on the Applied Pulse Properties via a Low Cost Instrumentation Setup", *IEEE Access*, vol. 7, no. 1, pp. 59413 – 59421, 2019

A.19. V. Ntinas, I. Vourkas, A. Abusleme, G. Ch. Sirakoulis, and A. Rubio, "Experimental Study of Artificial Neural Networks Using a Digital Memristor Simulator", *IEEE Trans. Neural Networks and Learning Systems*, vol. 29, no. 10, pp. 5098 – 5110, 2018

A.18. L. V. Gambuzza, M. Frasca, L. Fortuna, V. Ntinas, I. Vourkas, and G. Ch. Sirakoulis, "Memristor Crossbar for Adaptive Synchronization", *IEEE Trans. Circ. Syst. I: Reg. Papers*, vol. 64, no. 8, pp. 2124 – 2133, 2017

A.17. G. Papandroulidakis, I. Vourkas, A. Abusleme, G. Ch. Sirakoulis, and A. Rubio, "Crossbar-Based Memristive Logic-In-Memory Architecture", *IEEE Trans. Nanotechnol.*, vol. 16, no. 3, pp. 491 - 501, 2017

A.16. V. Ntinas, I. Vourkas, G. Ch. Sirakoulis, and A. Adamatzky, "Modeling Physarum Space Exploration using Memristors", *J. Phys. D: Appl. Phys*., vol. 50 (174004), 2017

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F. *Ph.D. and Diploma Thesis*

F.2. I. Vourkas, "Design and development of nanoelectronic circuits and architectures," *Ph.D. dissertation*, Democritus University of Thrace, November, 2014

F.1. I. Vourkas, (greek) "Ανάπτυξη Μεθοδολογίας Ανάθεσης Δεδομένων (data assignment) για Εφαρμογές που έχουν Υλοποιηθεί σε Αρχιτεκτονικές Network on Chip (NoC)" : (english) "Development of a data assignment methodology for applications implemented in Network-on-Chip (NoC) architectures," *M. Eng. (Diploma) thesis*, Democritus University of Thrace, November, 2008

Speaking Languages

Greek	**:**	**Native**	
English	**:**	Excellent	*Proficiency* degree from the *University of Cambridge* and the *University of Michigan*
Spanish	**:**	Excellent	*Intermediate* (Level B2) degree DELE from the *Cervantes Institute*

Additional Courses Taken

2020:	UTFSM University Teaching Diploma – Module 1	A 12-hour interactive course entitled "***Induction to Quality Teaching***", as part of the University Teaching Diploma offered by UTFSM towards continuous improvement in teaching methodologies.
2018:	UTFSM University Teaching Diploma – Module 2	A 16-hour interactive course entitled "***Learning Methodologies – Part I***", as part of the University Teaching Diploma offered by UTFSM towards continuous improvement in teaching methodologies.
2014:	EYE-FET Lab-Surfing Workshop	A two-day *Workshop* in the Future and Emerging Technologies (FET) Empowering Young Explorers-Researchers (EYE) project, held in Thessaloniki, Greece, aiming to facilitate networking, provide training and stimulate brainstorming toward project proposals for EU-funding.
2011:	Digital photography and Image Processing seminars	A series of six two-hour educational seminars by the IEEE Student Branch of Thrace and Dr. George Pavlides about the art, the technique, and the practice of *digital photography* and *image processing*

On-line Sources & Press Releases that Mention my Work & Contributions in Research/Teaching:

- **News** AC3E, USM, about my participation in coordination of the IEEE Circuits & Systems Society (CASS) Tour 2023 visit to the USM Central Campus in Valparaíso with three invited speakers from Chile, Brazil, and Spain: https://ac3e.usm.cl/usm-celebra-ciclo-internacional-de-conferencias-de-neuroingenieria-y-circuitos-nanoelectronicos/ && https://usm.cl/noticias/usm-celebra-ciclo-internacional-de-conferencias-de-neuroingenieria-y-circuitos-nanoelectronicos/
- **News** Online news portal "extranoticias.cl", about my participation in 12th Bootcamp on Integrated Circuit Design, organized by Synopsys Chile in the USM Central Campus in Valparaíso: https://www.extranoticias.cl/bootcamp-en-la-usm-apunta-a-preparar-estudiantes-para-la-industria-de-la-microelectronica-en-chile/
- **News** AC3E, USM, about my participation in 12th Bootcamp on Integrated Circuit Design, organized by Synopsys Chile in the USM Central Campus in Valparaíso: https://ac3e.usm.cl/bootcamp-en-la-usm-apunta-a-preparar-estudiantes-para-la-industria-de-la-microelectronica-en-chile/
- **News** Chilean journal "Electricidad", about conclusion of first year of the AC3E-Synopsys Chile Internship Program (2021-2022) which I coordinated for AC3E: https://www.revistaei.cl/2023/01/10/ac3e-y-synopsys-chile-desarrollan-programa-de-pasantias-para-formacion-en-diseno-de-circuitos-integrados/#
- **News** RedG9 Chilean University Network, about conclusion of first year of the AC3E-Synopsys Chile Internship Program (2021-2022) which I coordinated for AC3E: https://redg9.cl/2023/01/09/synopsys-chile-y-el-ac3e-desarrollaron-su-primer-programa-de-pasantias-para-la-formacion-de-talento-en-el-diseno-de-circuitos-integrados/
- **News** AC3E, USM, about conclusion of first year of the AC3E-Synopsys Chile Internship Program (2021-2022) which I coordinated for AC3E: https://ac3e.usm.cl/synopsys-chile-y-el-ac3e-desarrollaron-su-primer-programa-de-pasantias-para-la-formacion-de-talento-en-el-diseno-de-circuitos-integrados/
- **News** AC3E, USM, about my contribution in the formation of students who made it to the final stage of Synopsys Microelectronics Olympiad 2022 in Armenia: https://ac3e.usm.cl/alumnos-del-ac3e-ingenieros-y-estudiantes-de-todo-el-mundo-fueron-desafiados-en-olimpiada-internacional-de-microelectronica/
- **News** AC3E, USM, about meeting with Synopsys Customer Success Group (CSG) Director John Faase in AC3E, to evaluate the results of the AC3E-Synopsys collaboration in formation of students in IC Design, which I coordinate for AC3E: https://ac3e.usm.cl/group-director-de-synopsys-se-reunio-con-integrantes-del-programa-de-pasantias-entre-synopsys-chile-y-ac3e/
- **News** AC3E, USM, about the researchers who were awarded an ANID FONDECYT Research grant in the REGULAR category annual call, in which my project was mentioned: https://ac3e.usm.cl/7-proyectos-de-

investigadores-del-ac3e-se-adjudicaron-fondecyt-regular-2022/

- **News** AC3E, USM, about my contribution in the formation of the first generation of electronic engineers in Chile with practical experience on ReRAM devices and applications: https://ac3e.usm.cl/equipo-ac3e-esta-formando-rr-hh-en-el-uso-de-la-tecnologia-emergente-de-memorias-reram-en-chile/
- **Video** on **Youtube** with my talk in 2021 Spring Colloquium series of ECE TUC in Greece: https://www.ece.tuc.gr/index.php?id=13365
- **Special mention** in the official Blog of *Knowm Inc*. which refers to my recent publications and includes a personal interview about my trajectory in research of memristors and their applications, in https://knowm.org/exploring-the-resistance-change-per-energy-unit-as-universal-performance-parameter-for-resistive-switching-devices/
- **News** AC3E, USM, about *Knowm Inc*., which highlighted my contribution in "democratizing" the use and applicability of their commercial memristor devices, through their *official newsletter*: http://ac3e.usm.cl/empresa-de-eeuu-destaca-contribucion-de-investigador-ac3e/
- **News** AC3E, USM, about the short visit of Prof. Albert Cirera (UB, Spain) to UTFSM and the joint interview we had in AC3E: http://ac3e.usm.cl/experto-en-electronica-impresa-se-suma-al-trabajo-de-investigador-ac3e-para-profundizar-sobre-el-desarrollo-de-circuitos-con-memristors/
- **News** AC3E, USM, about the short visit of Prof. Antonio Rubio (UPC, Spain) and the joint interview we had in AC3E: http://ac3e.usm.cl/en/experto-en-microelectronica-de-la-universidad-politecnica-de-cataluna-upc-visita-la-usm-para-apoyar-actividades-de-docencia-e-investigacion/
- **News** USM, Valparaíso, about the award of *Santander Universities Program Scholarships*: https://noticias.usm.cl/2018/07/10/santander-universidades-entrega-becas-de-estudio-a-estudiantes-y-profesores-de-la-usm/
- **Video** on **Youtube** with my talk in 2017 Seiden Frontiers in Science Workshop in Haifa, Israel: https://www.youtube.com/watch?v=WcCxKd_bQR4
- **News** PUC, Chile, about the Tutorial lecture given in IEEE LASCAS 2017 in Bariloche, Argentina: https://www.ing.uc.cl/investigador-posdoctoral-en-ingenieria-uc-realizara-tutorial-en-conferencia-latinoamericana-ieee-lascas/

Senior academics who will provide academic and personal references for me:

Full Professor Georgios Ch. Sirakoulis (Ph.D. supervisor)
Department of Electrical & Computer Engineering (ECE), Democritus University of Thrace (DUTh)
Panepistimioupoli Xanthi-Kimmeria, Building B ECE, Room 1.22, GR67100, Xanthi, GREECE
Phone: +30 25410-79547
Web: http://gsirak.ee.duth.gr
Email: gsirak@ee.duth.gr

Full Professor Antonio Rubio (research collaborator)
Department of Electronic Engineering, Universidad Politécnica de Cataluña (BarcelonaTECH)
Campus Nord, Building C4, Jordi Girona Str. 1-3, P.C. 08034, Barcelona, SPAIN
Phone: +34 9 3401 7485
Web: http://futur.upc.edu/JoseAntonioRubioSola
Email: antonio.rubio@upc.edu

Full Professor Albert Cirera (research collaborator)
MIND-IN2UB, Department of Electronic and Biomedical Engineering, Universitat de Barcelona (UB)

Martí i Franquès 1, E-08028 Barcelona, SPAIN
Phone: +34 9 3403 9167
Web: https://webgrec.ub.edu/webpages/000004/cat/acirera.ub.edu.html
Email: acirera@ub.edu

Full Professor Fernando Auat (ex-colleague in UTFSM)
Department of Electronic Engineering, Universidad Técnica Federico Santa Maria (UTFSM)
Avda. España 1680, P.C. 2390123, Valparaíso, CHILE
Phone: +56 32 265 2617
Web: http://profesores.elo.utfsm.cl/~fauat/
Email: fernando.auat@usm.cl