CURRICULUM VITAE

Prof. DIMITRIS TSOUKALAS

ATHENS, APRIL 2023

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Name: **DIMITRIS TSOUKALAS**

Prof. Address: National Technical University of Athens, Dept. of Appl. Sciences

Date and place of birth: 1956, Athens

1. EDUCATION

1979: Diploma of Electrical and Mechanical Eng., National Technical Un. of Athens.

1980: Diplome DEA (Diplome d' Etudes Approfondies) in Electronics from ENSERG of Institut National Polytechnique de Grenoble (INPG).

1983: Diplome de Docteur-Ingenieur from INPG

In November 1994 I received the **'Habilitation a Diriger des Recherches'** from INPG for my contribution in guiding new researchers towards a PhD in the area of semiconductor process modeling and simulation.

2. PROFESSIONAL ACTIVITIES

2009 - today: Professor at School of Applied Mathematical and Physical Sciences, National Technical University of Athens.

2009-2012: Director Institute of Microelectronics, NCSR Demokritos and Vice President (2011-2012) of NCSR 'Demokritos'.

2002-2009: Assoc. Professor, Director of the postgraduate Diploma on 'Microsystems and Nanodevices', School of Applied Mathematical and Physical Sc., National Technical University of Athens.

1997 – 2002: Research Director (Grade A') at the Inst. of Microelectronics, NCSR 'Demokritos'.

December 1992 - 1997: Principal Researcher (Grade B') at the Inst. of Microelectronics, NCSR 'Demokritos'.

1989: Visiting Scientist at IBM Research Center at Yorktown Heights, USA.

1988 - 1992: Researcher in Charge (Grade C) at the Inst. of Microelectronics, NCSR 'Demokritos'.

1986 - 1988: Researcher in the Dept. of Electronics in the Nuclear Research Center 'Demokritos'. During this period, I participate in transferring MOS technology from the InterUniversity Center in Microelectronics (CIME) of Grenoble to 'Demokritos' through a bilateral cooperation.

1985 - 1986: I have a contract with the Dept. of Electronics of Nuclear Res. Cent. 'Demokritos'. I participate to the design of the clean room facility as well as to the ordering of equipment.

3. ADMINISTRATIVE RESPONSIBILITIES

2021-today: Director of the Dept. of Physics at the School of Applied Math. & Phys. Sciences of NTUA

2017-2021: Member of Management Board NTUA Technology Park

2016-2021: Director of the Laboratory of Advanced Materials and Micro-Nano Devices, Dept. of Physics, NTUA.

2016-18: Coordinating member in 'Advanced Functional Materials' Committee, General Secretariat of Research and Technology (GSRT)

2015- : Coordinator of Research and Postgraduate studies Committee at the School of Applied Math. & Phys. Sciences of NTUA.

2011-2012: Vice-President NCSR Demokritos

2009- 2012: Director IMEL, member of Management Board of NCSR Demokritos

2003-2009: Director postgraduate program 'Microsystems and Nanodevices' NTUA

2003-2008: Member of Management Board NTUA Technology Park

1998-2002: Deputy Director IMEL, NCSR Demokritos

4. RESEARCH INTERESTS AND ACTIVITIES

My research interests have initially focused on understanding and modeling of front-end silicon processing steps like diffusion, oxidation and implantation and the impact of process physics in predicting MOS device behavior in Silicon and Silicon-On-Insulator materials.
My interests have been later extended to include the use of nanotechnology in silicon processing for the development of new electronic devices focusing more particularly in memories using nanoparticles for charge storage elements formed either by silicon ion implantation in thin oxides and annealing, chemical self-assembly or sputtering. I have also initiated research in MEMS with emphasis in the use of wafer bonding for the development of micromechanical silicon based physical sensors and bio-chemical sensors.
Currently my research focus is on:

- Metal oxide thin films incorporating metallic or metal oxide nanoparticle assemblies with application in memristive devices for future crossbar non-volatile memories and neuromorphic circuits.
- Intelligent surfaces through the realization of physical or bio-chemical nanoparticle-based sensors and sensor arrays on flexible substrates.
- The use of ultrafast processing of semiconductors using laser beams.

I have published more than *180 papers in International journals* in the above areas which have received more than *3450 citations in Web of Science (h-index 31) and more than 4100 citations (h-index 32) in Scopus*. From my work I hold 3 patents (2 international and 1 national).

- **Participation in research projects**

I was coordinator of 5 European projects (*STIMULATE, REGPOT-MiNaSys, Marie-Curie-NANOSOURCE, IST/FET-FRACTURE, ESPRIT-CASE)* and participant in other 7 *(ESPRIT-RAPID, IST-FRENDTECH, IST-PULLNANO, GROWTH-NEON, ESPRIT-MICROMEDES, HCM - NEWSSTAND, HCM-NEXUSTASK)*
I have also participated in 10 projects funded by GSRT or the Ministry of Education in Greece either as coordinator or partner. The above funding has brought more than 5 MEuros to my organizations*)* during the period 1993-today.
A list of projects is following.

List of Projects

List of International Projects

Title: Nanoparticle sensor arrays on flexible substrates (Lloyds Register Foundation)
Total Budget: 60 kEuros, NTUA budget: 60 kEuros
Start date: 1/10/ 2016, Duration: 36 months
Project Coordinator

Title: Stimulate Public Attitude towards Advanced Materials (STIMULATE, EU)
Total Budget: 1,300 kEuros, NTUA budget: 150 kEuros
Start date: 1/7/ 2013, Duration: 24 months
Project Coordinator

Title: Micro and Nanosystems Center of Excellence (MiNaSys: Regpot, EU)
Total Budget: 2000 kEuros, IMEL/Demokritos budget: 2000 kEuros
Start date: 1/12/ 2009, Duration: 36 months
Project Coordinator

Title: Metallic and semiconducting nanoparticles for source for electronic and optoelectronic applications'
(NANOSOURCE: Marie-Curie, EU)
Total Budget: 1132 kEuros, NTUA budget: 365 kEuros
Start date: 1/8/ 2008, Duration: 48 months
Project partner

Title: Radiation hardness in nanocrystal memories
(European Space Agency)
Total Budget: 150 kEuros, NTUA budget: 100 kEuros
Starting Date: 11/2009, Duration: 24 months
Project Coordinator

Title: Pulling the limits of NanoCMOS
(PULLNANO: Information Society Technologies- EU)
Total Budget: 25000 kEuros, NTUA budget: 150 kEuros
Start Date: 1/6/2006, Duration: 30 months
Project partner

Title: Integrated polymer-based micro fluidic micro system for DNA extraction, amplification, and silicon-based detection
(MICRO2DNA, Information Society Technologies, EU)
Total Budget: 3000 kEuros, NTUA budget: 60 kEuros
Starting Date: 2/2006, Duration: 36 months
Project partner

Title: Front-end technology simulation
(FRENDTECH, Information Society Technologies, EU)
Total Budget: 2100 kEuros, IMEL/Demokritos budget: 360 kEuros
Starting Date: 7/2001, Duration: 36 months
Project partner

Title: Nanoelectronic devices and Fault-tolerant architectures
(FRACTURE, IST-Future and Emerging Technologies, EU)
Total Budget: 1600 kEuros, IMEL/Demokritos budget: 550 kEuros
Starting Date: 1/ 2001, Duration: 36 months
Project Coordinator

Title: Nanocrystals for Electronic Applications
(NEON, GROWTH-Materials, EU)
Total Budget: 2300 kEuros, IMEL/Demokritos Budget: 450 kEuros
Starting Date: 1/2001, Duration: 36 months
Project partner

Title: Redistribution and Activation Phenomena of dopants during Device Manufacturing
(RAPID, ESPRIT Long Term Research)
Total Budget : 1900 kECUs, IMEL Budget: 360 kECUs
Start date: 1/5/ 1997, Duration: 36 months
Partner

Title: Capacitive Silicon Sensors for Biomedical Applications
(CASE, ESPRIT-COPERNICUS)
Total Budget: 360 kECUs, IMEL Budget : 120 kECUs
Start date: 1/12/ 1996, Duration: 18 months
Project Coordinator

Title: Modular Microsystem for Controlled Medical Drug Release
(MICROMEDES, ESPRIT)
Total Budget: 3000 kECUs, IMEL Budget: 290 kECUs
Start date: 1/10/ 1993, Duration: 42 months

Title: NEXUSTASK (Human Capital & Mobility Network on Silicon Integrated Sensors)
Total Budget: 400 kECUs, IMEL Budget: 22 kECUs
Start date: 1/10/ 1993, Duration: 36 months

Title: NEWSSTAND (Human Capital & Mobility Network on Process and Device Simulation)
Total Budget: 155 kECUs, IMEL Budget: 13 kECUs
Start date: 1/10/1993, Duration: 36 months

List of National projects

Title: A microfluidic chip-based system for the detection of contaminants in water (GSRT)
Total Budget: 850 kEuros, NTUA budget: 205 kEuros
Start date: 1/11/2020, Duration: 30 months
Project participant

Title: RAPID, TIMELY DIAGNOSIS AND MONITORING OF MICROBIAL INFECTIONS BY MEANS OF AN AUTOMATED, POINT-OF-CARE, DIAGNOSTIC SYSTEM (GSRT)

Total Budget: 600 kEuros, NTUA budget: 100 kEuros
Start date: 1/08/2018, Duration: 36 months
Project participant

Title: Electronic Switching Resistance Devices for Neuromorphic Applications.
Total Budget: 50 kEuros, NTUA budget: 50 kEuros
Start date: 1/1/2020, Duration: 15 months
Project coordinator

Title: National Infrastructure in Advanced Materials, Nanotechnology and Nanoelectronics.
Total Budget: 4 MEuros, NTUA budget: 150 kEuros
Start date: 1/2/2018, Duration: 42 months
Project participant

Title: Research project IKY/Siemens
Total Budget: 47 kEuros, NTUA budget: 47 kEuros
Start date: 1/11/2015, Duration: 22 months
Project Coordinator

Title: Nanoparticles Assemblies for Resistive Memories (GSRT: ARISTEIA II)
Total Budget: 300 kEuros, NTUA budget: 250 kEuros
Start date: 18/2/2014/, Duration: 20 months
Project Coordinator

Title: Pesticides Monitoring Systems using Nanosensors for Safe Food Production
Total Budget: 350 kEuros, NTUA budget: 90 kEuros
Start date: 15/4/2012, Duration: 28 months
Scientific Coordinator

Title: Thin Film Silicon Photovoltaics (GSRT: SYNERGASIA)
Total Budget: 760 kEuros, NCSR Demokritos budget: 220 kEuros
Start date: 18/2/2011/, Duration: 36 months
Project Coordinator

Title: Nanoparticle chemical sensors (HERAKLEITOS, MINISTRY OF EDUCATION)
Total Budget: 45 kEuros, NTUA budget: 45 kEuros
Start date: 1/9/2010, Duration: 36 months
PhD fellowship to Mr. E. Skotadis under my supervision

Title: Laser annealing in silicon studied by experiments and simulation (HERAKLEITOS, MINISTRY OF EDUCATION)
Total Budget: 45 kEuros, NTUA budget: 45 kEuros
Start date: 1/6/2011, Duration: 36 months
PhD fellowship to Mr. S. Stathopoulos under my supervision

Title: Fabrication of nanoparticles and their application to charge storage (GSRT: Non-EU cooperation)
Total Budget: 60 kEuros, NTUA budget: 45 kEuros
Start date: 1/11/ 2006, Duration: 18 months
Project Coordinator

Title: Nanoelectronic Memory Devices, (PYTHAGORAS/MINISTRY OF EDUCATION)
Total Budget: 50 kEuros, NTUA budget: 50 kEuros
Start date: 1/8/ 2003, Duration: 36 months

Project Coordinator

Title: Diffusion and activation of dopants in Germanium (PENED/GSRT)
Total Budget: 130 kEuros, NTUA budget: 60 kEuros
Start date: 1/11/2005, Duration: 36 months
Project Coordinator

Title: Micromechanical sensors with application in food industry (PENED/GSRT)
Total Budget: 145 kEuros, NTUA budget: 60 kEuros
Start date: 1/11/2005, Duration: 36 months
Project partner

Title: Nanoparticles with application in low power electron devices and chemical sensors (Bilateral cooperation between Greece and UK)
Total Budget: 15 kEuros, NTUA budget: 15 kEuros
Start date: 1/8/ 2005, Duration: 24 months
Project Coordinator

Title: Nanocrystal memories (Empirikion Foundation)
Total Budget: 44 kEuros, NTUA budget: 44 kEuros
Start date: 1/8/ 2003, Duration: 24 months
Project Coordinator

Title: Silicon micromechanical humidity sensors
(GSRT)
Total budget: 55 M drahmas, IMEL Budget: 25 M drh.
Start date: 1/1/ 2000, Duration: 18 months

Title : Silicon micromechanical sensors using surface micromachining
(GSRT)
IMEL Budget : 10 M drh.
Start date: 1/6/ 1996, Duration: 24 months

Title: SOI structures by wafer bonding
(GSRT)
IMEL budget: 2 M drh.
Start date: 1/12/ 1993, Duration: 24 months

5. DEVELOPMENT ACTIVITIES

As a Professor at NTUA (2002- today) I have contributed to the:
- Design of a clean room laboratory equipped with thin film and nanoparticle deposition systems (sputtering and ALD) as well as to the electrical characterization laboratory establishment.
- Material characterization lab operation where a FESEM (equipped with a Raith e-beam lithography), an XRD, an AFM and a mechanical profilometer are supporting various research activities in the Department and NTUA in general.
As a Director of IMEL (2009-12) I have coordinated the submission and the successful execution of the EU funded project REGPOT that gave the opportunity of purchase and installation of an advanced e-beam system from VISTEC, the first in Greece that will be a key tool for future research and development activities. I have

also proposed the renewal of clean room and equipment infrastructure within the framework of a 'Demokritos' proposal to GSRT.
As a Researcher at 'Demokritos' I have contributed to the:
- Design of the clean room facility and MOS technology establishment at IMEL (1985-1990).
- Off-line micromechanical processing laboratory creation.
As a Researcher at 'Demokritos' I have cooperated with an Israeli start-up company in the period 2002-05 in the field of MEMS. Our pressure sensor that made part of the system developed by Remon Medical company, was successfully implanted in humans to monitor blood pressure (Sinaia Hospital NY, 6/2003).

6. SCIENTIFIC COMMITTEES, INVITED TALKS, REVIEWING

- Editorial Board member in the journals: Microelectronic Engineering (Elsevier), Sensors, Micromachines (MDPI), European Physical Journal-Applied Physics
- Chairman ESSDERC/ESSCIRC *(European Solid State Device Research Conference/European Solid State Circuits Research Conference*) Athens 2009, and member of International Program Committee (yearly, 1999- today)
- Chairman of *SISPAD '01* (Simulation of Semiconductor Devices and Processes IEEE Conference), Athens, Sept. 2001 and member of International Steering Committee 98-2004 and Program Committee, 98-2004 and 2016
- Member of Organizing Committee MRS Symposium on *'Materials and Processes for non-volatile memories'*
  - MRS Fall Meeting, Boston 2004
  - MRS Spring Meeting, San Francisco 2007
- Member of International Program Committee Eurosensors Conference (1997-2012)
- Member of International Program Committee of Transducers 2013, 2017, 2019, 2023
- Member of International Program Committee Micro and Nano Engineering International Conference (yearly, 2002-today)

- I have given invited talks in International or National Conferences and Workshops (27) and Universities/Research Organizations (7) presented below.

Invited presentations at International Conferences and Workshops

1. CIMTEC Congress, 9th Forum on New Materials, Symposium on Functional Nanomaterials for New Generation Solid State Chemical Sensors 'Nanoparticle networks for label-free biosensing', Perugia Italy, June 25-29, 2022
2. Physics of Advanced Materials, ICPAM-13, 'Resistive Switching Devices for memory and computing applications' Sant Feliu de Guixols, Costa Brava, Spain, September 24–30, 2021
3. 6th International Workshop on Microsystems 'Nanoparticle based sensors' Sindos, Greece, Dec. 2021
4. 64th Vacuum Society Meeting 'Integration of Metallic Nanoparticles in Sensing and Memory Devices for Resistance Modulation and Enhanced Switching', Tampa, Florida, USA 29 Oct-3 Nov. 2017

5. 5th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems (*IC4N*) 'Enhancing the switching properties of metal oxide resistive memories by nanoparticle incorporation', Porto Heli, Greece, June 2016
6. Workshop on Frontier in Electronics (WOFE) 'Understanding the formation of conductive filaments in RRAM through the design of experiments and simulations' San Juan, USA 15-18 Dec. 2015
7. 5th International Conference on Materials and Applications for Sensors and Transducers (IC-MAST) 'Nanoparticle sensors' Myconos 8-11 Sept. 2015
8. Intern. Semiconductor Device Research Symposium (ISDRS) 'Metal and metal oxide nanoparticles for emerging memories' 11-13 Dec. 2013 Bethesda, USA
9. National Solid State Physics and Materials Sc. Conference 'Nanoparticle assemblies and their applications' Athens, Sept. 2013
10. CIMTEC 2012 'Inorganic nanoparticles for either charge storage or memristance modulation' Montecatini Terme, 10-15 June 2012
11. Nano2012, 'Nanoparticles assemblies as biochemical sensors', Rhodes 26-31 August 2012
12. Nanotexnology 2011, 'Nanoparticles for chemical and physical sensing', Thessaloniki 12-14 July 2011
13. 9th International Symposium on Test and Measurement, 'Nanoparticle sensors' Suzhou, China, 4-7 August 2011
14. Univ. of Patras 'Research activities of IMEL', June 2010
15. Nanoparticles 2008, 'Memory effects in insulators incorporating semiconducting or metallic nanoparticles' Orlando, Florida, USA, May 2008
16. Smart Materials and Micro-Nanosystems, 'Nanoparticles for charge storage', Acireale, Sicily, June 2008
17. Gordon Research Conference/ Supramolecules and self-assembly, 'Charge storage in nanoparticles for memory applications' Il Ciocco, Italy, May 2007
18. AsiaNano 2006 'Electronic Memories based on organic thin films' Nov. 2006, Busan, Korea (together with M. Petty)
19. First International Workshop on Semiconductor nanocrystals, SEMINANO 2005, 'Nanocrystals and their applications in nanocrystal memories' Budapest, August 2005
20. E-MRS Symposium on Materials Science and Device Issues for Future Si-based Technologies, 'Recent advances in nanocrystal memories', Strasbourg June 2005
21. Technical Un. Of Dresden 'Nanocrystals and their application in nonvolatile memories' October 2005
22. EU Workshop on Research Training in Nanosciences and Nanotechnologies: Current Status and Future Needs, 'Postgraduate education in Nanotechnology at NTUA', Brussels, April 2004
23. Hellenic Association of Physics, 'From microelectronics to nanoelectronics and nanotechnology' Loutraki, Greece, February 2004
24. Technical Un. Of Warsaw on 'MEMS capacitive type devices obtained with wafer bonding', Warsaw, Feb. 2004
25. 5th International Research Workshop on Future Information Processing Technologies organized by EU, SRC(USA), SELETE (Japan), 'Gold self-assembled nanoparticles for non-volatile memories', Miyazaki, Japan, 5-7 Nov. 2003
26. NSF-EU Workshop on Nanomaterials and Nanotechnology, 'Nanoparticle Memories', Boston, US, December 2002

27. Second International Research Workshop on Future Information Processing Technologies 'MOS nanocrystal memory', Vancouver, Canada, August 1999

28. ST-Microelectronics 'Activities on Silicon On Insulator at IMEL' Tours, France , Jan. 1998

29. '20th International Semiconductor Conference (CAS'97)', 'The influence of process physics on the short-channel behaviour of MOS devices. The example of the Reverse Short Channel Effect' Sinaia, Romania, Oct. 1997

30. Second International Research Workshop on Future Information Processing Technologies 'Single-Electron Device Fabrication by extending current Silicon Technology', Sapporo, Japan, August 1997

31. National Solid State Physics Association 'The continuing growth of microelectronics as a result of research industry collaboration', Athens June 1997

32. Univ. Of Thrace, Dept. EE 'Silicon as the material for microelectronic and micromechanical devices', June 1997

33. Dept. Of Physics, Univ. of Crete 'Simulation of silicon processing technologies', Dec. 1997

34. Max-Planck Institut fuer Mikrostrukturphysik (Prof. U. Goesele) 'Application of the Wafer Bonding technique for process physics experiments and micromechanical sensors', Halle, May 1996

- I have been a reviewer for International Journals (*Nature Communications, Advanced Materials, Small, Nanoscale, Nature Scientific. Rep., ACS Mater. & Interf., ACS Langmuir, ACS J. Phys. Chem., J. Appl. Phys., Appl. Phys. Lett., IEEE Trans. Electr. Dev., IEEE Electron Dev. Lett., IEEE Trans. On Nanotechnology, Microelectronic Eng., J. Electrochem. Soc. Solid-St. Electronics, Semiconductor Sc. & Tech., J. Phys. D, Sens. & Actuat. A, Sens.&Act. B, Synthetic Metals, J. Vacuum & Technol. B).*

- I have been a reviewer for European and national funding organizations as well as prize organizations in Greece (Bodosakis Prize) and Japan (**'**Japan Prize' from Japan Prize Foundation annually from 2006).

- I was a member of the *Expert Evaluation Committee* of the French Laboratory Institut d' Electronique de Microélectronique et de Nanotechnologie (CNRS-IEMN) in Lille, France (January 2019)

7. EDUCATIONAL ACTIVITIES

- I have established and I was the first Director of postgraduate diploma on 'Microsystems and Nanodevices' at NTUA with the participation of 5 Schools from NTUA and IMEL/NCSR Demokritos for the period 2002-2009. Within this diploma I use to teach a course on Micro and Nano sensors and a course on Nanoelectronic Devices.
- I have taught courses on Semiconductor Devices, Microsystems Technology and Electromagnetism for undergraduate students.
- I have supervised a total number of 30 diploma or postgraduate diploma thesis. Under my supervision 16 candidates have obtained their PhD and 4 others are currently preparing it. Namely:

- Ms. Maria Kainourgiaki, Electrical Engineer, ELIDEK fellow
- Mr. Charalampos Tsioustas, Electrical Engineer, supported by research project
- Mr. Georgios Klitsiotis, Applied Physics, supported by research project
- Mr. Stavros Kitsios, Physicist, IKY fellow
- Dr. Charalampos Papaconstantinopoulos, ELIDEK fellow, recently graduated
- Dr. Leonidas Madianos, own business
- Dr. Panagiotis Bousoulas, post-doctoral researcher at NTUA, recipient of D. Chorafas Foundation Prize 2018
- Dr. Spyros Stathopoulos, Experimental Officer at Micro Nano Syst. Lab, University of Edinburgh, UK
- Dr. Lampros Patsiouras, engineer at ITMA innovation, Athens
- Dr. Panagiotis Tsouroutas, own business
- Dr. Evangelos Skotadis, post-doctoral researcher at NTUA, Lecturer Univ. of West Attica
- Dr. Jun Tang, Professor at North Univ. of China
- Dr. Antonios Florakis, energy consultant for PV to TotalEnergies, S.A, Leuven, Belgium
- D. Emanuele Verrelli, Senior Lecturer, Dept. of Physics, University of Hull, UK
- Dr. Pascal Normand, Dr. Christos Tsamis, Dr. Stavros Chatzandroulis (Researchers Grade A, Inst. of Nanoscience and Nanotechnology, NCSR Demokritos)
- D. Dimitrios Skarlatos, Professor, Dept. of Physics, University of Patras
- Dr. Stavroula Kolliopoulou, Educational Advisor, Ministry of Education
- Dr. Dimitris Goustouridis, Assoc. Professor, Dept. of Electrical and Electronic Engineering, Univ. of West Attica

- I have participated in numerous thesis examination committees in Greek Universities and abroad (Univ. Paul Sabatier Toulouse, ETH Zurich, Institut National Polytechnique de Grenoble, Ecole Polytechnique Paris, Univ. of Cambridge, Technical Un. of Dresden, University College Cork).

8. PUBLICATIONS

International Journal publications

1. G. Klitsiotis, P. Bousoulas, C. Tsioustas, D. Tsoukalas, 'Demonstration of artificial afferent nerve properties with forming-free and SiO2-based memristive synapses', *IEEE Transactions on Electron Devices*, accepted for publication

2. C Tsioustas, P Bousoulas, G Kleitsiotis, D Tsoukalas, Pulse-stream impact on recognition accuracy of reservoir computing from SiO2-based low power memory devices *APL Machine Learning* 1 (2), 026103 (2023)

3. C. Tsioustas, P. Bousoulas, J. Hadfield, T.P. Chatzinikolaou, I.-A. Fyrigos, V. Ntinas, M.-A. Tsompanas, G. Sirakoulis, D. Tsoukalas 'Simulation of low power self-selective memristive neural networks for in situ digital and analogue artificial neural network applications' *IEEE Trans. on Nanotechnology*, 21, 505 (2022)

4. C. Papakonstantinopoulos, P. Bousoulas, E. Aslanidis, E. Skotadis, M. Tsigkourakos, D. Tsoukalas 'Highly sensitive stretchable sensor combined with low-power memristor for demonstration of artificial mechanoreceptor properties' *Flexible and Printed Electronics* 7, 035024, (2022)

5. S. Kitsios et al. 'Demonstration of Enhanced Switching Variability and Conductance Quantization Properties in a SiO2 Conducting Bridge Resistive Memory with Embedded Two-Dimensional MoS2 Material', *ACS Appl. Electron. Mater.*, 4, 6, 2869–2878 (2022)

6. P Bousoulas, C Tsioustas, J Hadfield, V Aslanidis, S Limberopoulos, D Tsoukalas 'Low Power Stochastic Neurons From SiO2-Based Bilayer Conductive Bridge Memristors for Probabilistic Spiking Neural Network Applications—Part I' *IEEE Transactions on Electron Devices* 69, 2360 (2022)

7. E Skotadis, E Aslanidis, G Kokkoris, EAV Kousoulas, A Tserepi, S. Chatzandroulis, D. Tsoukalas, 'Flow determination via nanoparticle strain sensors for easy Lab on Chip integration', *Sensors and Actuators A* 344, 113765 (2022)

8. P. Bousoulas, S. Kitsios, T.P. Chatzinikolaou, I-A. Fyrigos, V. Ntinas, M.-A Tsompanas, G. Sirakoulis, D. Tsoukalas 'Material design strategies for emulating neuromorphic functionalities with resistive switching memories, *Japanese Journal of Applied Physics* 61 (2022)

9. M Kaloumenou, E Skotadis, N Lagopati, E Efstathopoulos, D Tsoukalas, 'Breath Analysis: A Promising Tool for Disease Diagnosis—The Role of Sensors', *Sensors* 22 (3), 1238 (2022)

10. P Bousoulas, C Tsioustas, D Tsoukalas, 'Emulating low power nociceptive functionalities with a forming-free SiO2/VOx conductive bridge memory with Pt nanoparticles', *Applied Physics Letters* 120 (25), 253509 (2022)

11. M. Tsigkourakos, M. Kainourgiaki, E. Skotadis, K.P. Giannakopoulos, D. Tsoukalas, Y.S. Raptis 'Capping technique for chemical vapor deposition of large and uniform MoS2 flakes' *Thin Solid Films* (2021) 138808

12. C. Papakonstantinopoulos, P. Bousoulas, M. Tsigkourakos, D. Sakellaropoulos, L. Sygellou, D. Tsoukalas, 'Highly Flexible Artificial Synapses from SiO2-Based Conductive Bridge Memristors and Pt Nanoparticles through a Crack Suppression Technique', *ACS Applied Electronic Materials*, 10.1021/acsaelm.1c00302 (2021)

13. E Aslanidis, E Skotadis, D Tsoukalas, 'Simulation tool for predicting and optimizing the performance of nanoparticle-based strain sensors' *Nanotechnology* 32 (27), 275501 (2021)

14. P. Bousoulas, D. Sakellaropoulos, D. Tsoukalas, 'Tuning the analog synaptic properties of forming free SiO2 memristors by material engineering', *Applied Physics Letters* 118 (14), 143502 (2021)

15. P. Bousoulas, M. Panagopoulou, N. Boukos, D. Tsoukalas, 'Emulating artificial neuron and synaptic properties with SiO2-based memristive devices by tuning threshold and bipolar switching effects', *Journal of Physics D: Applied Physics* 54 (22), 225303 (2021)

16. E. Skotadis, A. Kanaris, E. Aslanidis, N. Kalatzis, F. Chatzipapadopoulos, N. Marianos, D. Tsoukalas, 'Identification of two commercial pesticides by a nanoparticle gas-sensing array', *Sensors* 21 (17), 5803 (2021)

17. P. Bousoulas, C. Papakonstantinopoulos, S. Kitsios, K. Moustakas, G. Sirakoulis, D. Tsoukalas, 'Emulating Artificial Synaptic Plasticity Characteristics from SiO2-Based Conductive Bridge Memories with Pt Nanoparticles', *Micromachines* 12 (3), 306 (2021)

18. F. Zacharatos, M. Duderstadt, E. Almpanis, L. Patsiouras, K. Kurselis, D. Tsoukalas, C. Reinhardt, N. Papanikolaou, B. N Chichkov, I. Zergioti 'Laser printing of Au nanoparticles with sub-micron resolution for the fabrication of monochromatic reflectors on stretchable substrates, *Optics & Laser Technology* 135, 106660 (2021)

19. D. Sakellaropoulos, P. Bousoulas, C. Papakonstantinopoulos, S. Kitsios, D. Tsoukalas, 'Impact of Active Electrode on the Synaptic Properties of SiO2-Based Forming-Free Conductive Bridge Memory', *IEEE Transactions on Electron Devices* 68 (4), 1598-1603 (2021)

20. E. Aslanidis, E. Skotadis, D. Tsoukalas, 'Resistive crack-based nanoparticle strain sensors with extreme sensitivity and adjustable gauge factor made on flexible substrates' *Nanoscale*, 13 (5), 3263-3274 (2021)

21. E. Skotadis, E. Aslanidis, M. Kainourgiaki and D. Tsoukalas 'Nanoparticles Synthesised in the Gas-Phase and their Applications in Sensors: A Review', *Appl. Nano*, 1, 70–86; doi:10.3390/applnano1010006 (2020)

22. E. Skotadis, A. Kanaris, E. Aslanidis, P. Michalis, N. Kalatzis, F. Chatzipapadopoulos, N. Marianos, D. Tsoukalas, 'A sensing approach for automated and real-time pesticide detection in the scope of smart-farming' *Computers and Electronics in Agriculture*, 178, 105759 (2020)

23. P. Bousoulas, D. Sakellaropoulos, C. Papakonstantinopoulos, S. Kitsios, C. Arvanitis, E. Bagakis and D. Tsoukalas, 'Investigating the origins of ultra-short relaxation times of silver filaments in forming-free SiO2 -based conductive bridge memristors' *Nanotechnology* 31, 454002 (2020)

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CITATIONS

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