

# ΣΥΝΤΟΜΟ ΒΙΟΓΡΑΦΙΚΟ ΣΗΜΕΙΩΜΑ

## Μιχάλης Ε. Ζερβάκης

Ξεκίνησα το ακαδημαϊκό μου ταξίδι με τις σπουδές μου ως Ηλεκτρολόγος Μηχανικός στο Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης. Συνεχίζοντας τις μεταπτυχιακές μου σπουδές, έλαβα το Μάστερ και το Διδακτορικό δίπλωμα από το Πανεπιστήμιο του Τορόντο. Διετέλεσα επίκουρος καθηγητής στο Πανεπιστήμιο της Μινнесότα και αναπληρωτής καθηγητής στο Τμήμα Ηλεκτρονικών Μηχανικών και Μηχανικών Υπολογιστών του Πολυτεχνείου Κρήτης. Από το 1999 εκλέχθηκα στη βαθμίδα του Καθηγητή στο Πολυτεχνείο Κρήτης. Στη θητεία μου στο Πολυτεχνείο Κρήτης έχω αφιερωθεί στην διδασκαλία και έρευνα με στόχο το να προσφέρω όσο δυνατόν υψηλού επιπέδου εκπαίδευση στους φοιτητές μας. Παράλληλα, αφιέρωσα μεγάλη προσπάθεια στο διοικητικό έργο της Σχολής ΗΜΜΥ και γενικότερα του Πολυτεχνείου Κρήτης. Διετέλεσα μέλος της Συγκλήτου, αντιπρόεδρος του Τμήματος και μέλος της Επιτροπής Ερευνών, όπου λειτούργησα για πολλά χρόνια ως αντιπρόεδρος και τα τελευταία πέντε χρόνια ως πρόεδρος. Τα τελευταία πέντε χρόνια συμμετέχω στη διοίκηση του Ιδρύματος, σαν Αντιπρύτανης Έρευνας και Δια-βίου Εκπαίδευσης. Σε διεθνές επίπεδο έχω διατελέσει μέλος πολλών επιστημονικών οργανισμών, αλλά και διεθνών συνεδρίων της περιοχής μου. Η ερευνητική μου περιοχή εστιάζεται σε θέματα επεξεργασίας και ανάλυσης σήματος και εικόνας, μηχανικής μάθησης, αναγνώρισης προτύπων και μεθόδους πρόβλεψης, με εφαρμογές στη βιοϊατρική, περιβάλλον και βιομηχανία. Διευθύνω το Εργαστήριο Ψηφιακής Επεξεργασίας Σήματος και Εικόνας, το οποίο και ίδρυσα στο Πολυτεχνείο Κρήτης, αλλά και το Εργαστήριο Αυτοματισμού. Τα ερευνητικά αποτελέσματα της εργασίας μου με φοιτητές και συνεργάτες συνοψίζονται σε άνω των 350 επιστημονικών δημοσιεύσεων σε διεθνή περιοδικά και πρακτικά διεθνών συνεδρίων. Έχω επίσης συγγράψει, υποβάλλει και συμμετάσχει σε πολλά επιστημονικά προγράμματα στον Ελληνικό, Ευρωπαϊκό και διεθνή χώρο. Έχω επίσης συμμετάσχει στη διοργάνωση πολλών επιστημονικών συνεδρίων και συμποσίων και διατελώ κριτής άρθρων σε πολλά διεθνή επιστημονικά περιοδικά. Μέσω των ερευνητικών μου συνεργασιών, έχω προσπαθήσει να συνεισφέρω στην εξωστρέφεια και ακαδημαϊκή ποιότητα του Πολυτεχνείου Κρήτης, αλλά και να υποστηρίξω τις προσπάθειες φοιτητών μας να συνεχίσουν στα υψηλότερου επιπέδου ιδρύματα του εξωτερικού, απτύσσοντας εξειδικευμένες δεξιότητες και καταλαμβάνοντας θέσεις στον διεθνή ακαδημαϊκό αλλά και ερευνητικό-επαγγελματικό χώρο.

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## **PERSONAL DATA**

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## **EDUCATION**

### Ph.D.

Department of Electrical Engineering, Communications Group, June 1990 University of Toronto, Toronto, Canada;

### M.A.Sc.

Department of Electrical Engineering, Communications Group, December 1985 University of Toronto, Toronto, Canada;

### Diploma of Engineering

Department of Electrical Engineering, June 1983, Aristotelian University of Thessaloniki, Thessaloniki, Greece.

## **PROFESSIONAL EXPERIENCE**

### Oct. 99-Present

Professor at the Technical University of Crete, Greece, School of Electrical and Computer Engineering (Formerly "Department of Electronic and Computer Engineering" up to 2016).

### Feb. 95-Sept. 99

Associate Professor at the Technical University of Crete, Greece, Department of Electronic and Computer Engineering.

### Sept. 90-Nov. 94

Assistant Professor at the University of Minnesota, Duluth, USA, Department of Computer Engineering.

### Feb. 90-July 90

Research Scientist, AUG Signals, Toronto, Canada. Conducted research on restoration of multidimensional IR images, moving sequences, and target detection.

Sept. 84-May 90

Teaching and Research Assistant at the University of Toronto, Department of Electrical Engineering.

May 82-Sept. 82

Engineering Assistant, Public Electricity Company, Greece. Supervised the establishment and testing of a new power station in Heraklion, Crete, Greece.

May 81-Sept. 81

Engineering Assistant, Public Electricity Company, Greece. Worked in the maintenance of the local power system in Heraklion, Crete, Greece.

### **ADMINISTRATIVE ASSIGNMENTS at TUC**

Vice Rector of Research and Lifelong Learning Dec. 2017- Present: Technical University of Crete

Special Research Fund Account: President Dec.2017-present; Vice-Chair (2005-2017); Member (2005). The Special Research Fund Account (ELKE) is handling the administrative management of all research, educational and development projects.

Associate Dean 2013- Nov. 2017: School of Electrical and Computer Engineering. Responsibilities of the 4-member Dean's Council include the day-to-day management and administration of the School, overseeing the School's educational programs and constituting the committees for the recruitment, promotion and evaluation of faculty. During October 2015 the School went through an External Review of Quality Assurance, overseen by the Dean and the Associate Dean. Furthermore, during July 2016 and under the scrutiny of a public evaluation system, the School achieved to be awarded the current name of "Electrical and Computer Engineering" from the original one of "Electronics and Computer Engineering".

Member of the Senate 2015- 2017: Academic authority of the University, responsible for developing the educational and research policy of the entire institution.

2014-2015 Member of the Team for the support of the Academic Program in External Review: The team was responsible for the support of Quality Assurance processes in the School of ECE for the External Review Committee Evaluation.

Director 1995-Present

Digital Image and Signal Processing LABORATORY (DISPLAY), Technical University of Crete, Greece, September 1995 to Present. This lab has been legally established as a public body in 1996, under my direction and is equipped with state-of-the-art facilities on imaging systems for surveillance and monitoring.

Director 2007-Present

Laboratory of Automation, Technical University of Crete, Greece, September 2007 to Present. This lab has been renovated and equipped with state-of-the-art experimental facilities for

automatic control.

### **SCIENTIFIC ADMINISTRATIVE ASSIGNMENTS**

- **Associate Editor**, since 1/1/2017, Journal of Biomedical Signal Processing and Control, <https://ees.elsevier.com/bspc>
- **Associate Editor**, since 1/1/2017, IEEE Journal of Biomedical and Health Informatics, <http://jbhi.embs.org/editorial-board/associate-editors/>
- **2016 Academic Program Evaluator**: Participation in the External Evaluation Committee for the Evaluation -Accreditation of three Programs of Study in the Cypriot Academic system.
- **Technical Committee co-chair**, IEEE Instrumentation and Measurement Society, TC-19 Imaging Measurements and Systems, since 20/1/2017 <https://ieee-ims.org/technical-committees>
- **Associate Editor**, 1993-95, IEEE Transactions on Acoustics, Speech and Signal Processing
- **Director 1992-1994**: Signals and Systems Research Center (SSRC), University of Minnesota, Duluth, September 1992 to November 1994. In short time, the facility established collaboration with the Mayo clinic, the Natural Resources Research Institute (NRRI), the Superior Recycled Fiber Industries (SRFI), Minnesota Power, and the Minnesota Department of Transportation (MNDOT).
- **Lab Coordinator 1990-1994**: Signal Processing and Communications laboratory, University of Minnesota, Duluth, September 1990 to November 1994.

### **JOURNAL PUBLICATIONS**

- [1] M.E. Zervakis and A.N. Venetsanopoulos, "Design of Three-Dimensional Digital Filters Using Two-Dimensional Rotated Filters", IEEE Trans. on Circuits and Systems, vol CAS-34, no. 12, pp. 1452-1470, December, 1987.
- [2] M.E. Zervakis and A.N. Venetsanopoulos, "Three-Dimensional Rotated Filters; Design, Stability, and Applications", Circuits, Systems, and Signal Processing, vol. 9, no. 4, pp. 383-408, 1990.
- [3] M.E. Zervakis and A.N. Venetsanopoulos, "M-Estimators in Robust Nonlinear Image Restoration", Optical Engineering, vol. 29, no. 5, pp. 455-470, May 1990.
- [4] M.E. Zervakis and A.N. Venetsanopoulos, "A Class of Non-Iterative Algorithms for Nonlinear Image Restoration", IEEE Trans. on Circuits and Systems, vol. CAS-38, no. 7, pp. 731-744, July 1991.
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- [7] M.E. Zervakis and A.N. Venetsanopoulos, "Convergence Properties of Gauss-Newton Iterative Algorithms in Nonlinear Image Restoration", *Multidimensional Systems and Signal Processing*, vol. 2, pp. 287-317, 1991.
- [8] M.E. Zervakis and A.N. Venetsanopoulos, "Iterative Least Squares Estimators in Nonlinear Image Restoration", *IEEE Trans. on Acoustics, Speech, and Signal Processing*, vol. SP-40, no. 4, pp. 927-945, April 1992.
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- [10] M.E. Zervakis and T.M. Kwon, "Robust Estimation Techniques in Regularized Image Restoration", *Optical Engineering*, vol. 31, no. 10, pp. 2174-2190, Oct. 1992.
- [11] M.E. Zervakis, "Optimal Restoration of Multichannel Images Based on Constrained Mean-Square Estimation", *Journal of Visual Communications and Image Representation*, vol. 3, no. 4, pp. 392-411, Dec. 1992.
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- [15] T.M. Kwon, M.E. Zervakis, and A.N. Venetsanopoulos, "Design and Analysis of a Class of Self-Organizing and Trainable Fuzzy Controllers", *Journal of Intelligent and Robotic Systems*, vol. 8, pp. 407-431, 1994.
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Single-Trial Auditory Event-Related Activity in Healthy Subjects and Alzheimer's Disease Patients", *Journal of Current Alzheimer Research*, Vol. 7, no. 4, pp. 334-347, June 2010.

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**[181]** E. Sergaki, G. Spiliotis, I. Vardiambasis, T. Kapetanakis, A. Krasoudakis, G. Giakos, M. Zervakis, A. Polydorou, "Application of ANN and ANFIS for detection of brain tumors in MRIs by using DWT and GLCM texture analysis", 2018 IEEE International Conference on Imaging Systems and Techniques (IST), Krakow, Poland, Oct 2018

**[182]** A. Beninatti, N. Douard, G. Bauman, J. Hoogerhyde, A. Passalaris, Z. Giakos, M. Nowak, S. Shrestha, H. Mohamed, M. Zervakis, G. Livanos, G. Giakos, "Space Target Motion Salient



Classification using Polarimetric Retina Vision Sensing Principles”, 2018 IEEE International Conference on Imaging Systems and Techniques (IST), Krakow, Poland, Oct 2018

**[183]** A. Zormpas, K. Moirogiorgou, K. Kalaitzakis, G. Plokamakis, P. Partsinevelos, G. Giakos, M. Zervakis, “Power Transmission Lines Inspection using Properly Equipped Unmanned Aerial Vehicle (UAV)”, 2018 IEEE International Conference on Imaging Systems and Techniques (IST), Krakow, Poland, Oct 2018

**[184]** GA Klados, M Zervakis, R Dacosta-Aguayo, A Fratini, MA Klados, “Towards a Novel Way to Predict Deficits After a Brain Lesion: A Stroke Example”, 2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BiBe2019), Oct 28-30, Athens, Greece

**[185]** K Giannakaki, G Giannakakis, P Vorgia, M Klados, M Zervakis, “Automatic absence seizure detection evaluating matching pursuit features of EEG signals”, 2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BiBe2019), Oct 28-30, Athens, Greece

**[186]** G Giannakakis, K Michalopoulos, N Tsekos, P Vorgia, K Giannakaki, M. Zervakis, “Seizure detection using common spatial patterns and classification techniques”, 2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BiBe2019), Oct 28-30, Athens, Greece

**[187]** VS Dimakopoulos, M Antonakakis, G Moeddel, J Wellmer, S Rampp, M Zervakis, C Wolters, “Combined EEG/MEG Source Reconstruction of Epileptic Activity using a Two-Phase Spike Clustering Approach”, 2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BiBe2019), Oct 28-30, Athens, Greece

**[188]** K Politof, M Antonakakis, A Wollbrink, M Zervakis, CH Wolters “Effective Connectivity in the Primary Somatosensory Network using Combined EEG and MEG”, 2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BiBe2019), Oct 28-30, Athens, Greece

**[189]** Kakamoukas, G; Sariciannidis, P; Livanos, Georgios; Zervakis, M; Ramnalis, D; Polychronos, V; Karamitsou, T; Folinias, A; Tsitsiokas, N; "A Multi-collective, IoT-enabled, Adaptive Smart Farming Architecture", 2019 IEEE International Conference on Imaging Systems and Techniques (IST), 8-10 Dec. 2019, Abu Dhabi, UAE

**[190]** N Badogiannis, K Moirogiorgou, M Zervakis, A Dollas, N Papandroulakis, “Real-Time Embedded System for Hole Detection in Fish Cage Nets”, 2019 IEEE International Conference on Imaging Systems and Techniques (IST), 8-10 Dec. 2019, Abu Dhabi, UAE

**[191]** Papadogiorgaki, M; Mezaris, V; Grammalidis, Grigoriadis, K; Bei, E; Livanos, G; Zervakis, M; “Quality of life support system for people with intellectual disability”, Proceedings of the 13th ACM International Conference on Pervasive Technologies Related to Assistive Environments, PETRA 2020

**[192]** Livanos, G; Ramnalis, D; Polychronos, V; Balomenou, P; Sarigiannidis, P; Kakamoukas, G; Karamitsou, T; Angelidis, P; Zervakis, M; “Extraction of Reflectance Maps for Smart Farming Applications Using Unmanned Aerial Vehicles”, IEEE 12th International Symposium on Communication Systems, Networks and Digital Signal Processing (CSNDSP), 2020

**[193]** Torakis, I; Bei, E; Sfakianakis, S; Pateras, I; Zervakis, M; “Pancreatic Cancer and Its

Correlation with Embryogenesis: Identification of Biomolecular Markers Using Machine Learning Methods”, 8<sup>th</sup> European Medical and Biological Engineering Conference (IEEE EMBC 2021), pp. 952-961, 2020, Springer, IFMBE Proceedings, vol 80. Springer, Cham. [https://doi.org/10.1007/978-3-030-64610-3\\_106](https://doi.org/10.1007/978-3-030-64610-3_106)

**[194]** A. Vogiatzis, G. Chalkiadakis, K. Moirogiorgou, M. Zervakis, “A Novel One-vs-Rest Classification Framework for Mutually Supported Decisions by Independent Parallel Classifiers”, 2021 IEEE Intl Conf. on Imaging Systems and Techniques (IEEE IST), Aug, 2021

**[195]** A. Vogiatzis, G. Chalkiadakis, K. Moirogiorgou, G. Livanos, M. Papadogiorgaki, M. Zervakis, “Dual-Branch CNN for the Identification of Recyclable Materials”, 2021 IEEE Intl Conf. on Imaging Systems and Techniques (IEEE IST), Aug, 2021 **Best Student Paper Award winner**

**[196]** K. Politof, M. Antonakakis, A. Wollbrink, C. Wolters, M. Zervakis, “Reconstruction of the Very Early Thalamo-Cortical Network with Combined EEG and MEG on Realistic Head Modeling”, 10th International IEEE/EMBS Conference on Neural Engineering (NER). Pp. 373-374, May 2021

**[197]** G Sdoukopoulou, M Antonakakis, S Rampp, V Sakkalis, J Wellmer, CH Wolters and M Zervakis (2021). Cluster-based Combined EEG/MEG Source Analysis of High Frequency Oscillatory Activity from a Multi-Focal Epilepsy Case. 10th International /MBS Conference on Neural Engineering (NER), May 2021.

**[198]** K. Giannakaki, K. Moirogiorgou, M. Zervakis, N. Anousakis-Vlachochristou, G. Matsopoulos, C. Komporozos, V. Sourides, G. Katsimagklis, Maria Drakopoulou, K. Toutouzas, C. Avgeropoulou, A. Androulakis, “Automatic aortic valve area detection in echocardiography images using convolutional neural networks and U-net architecture for bicuspid aortic valve recognition”, 2021 IEEE Intl Conf. on Imaging Systems and Techniques (IEEE IST), Aug, 2021

**[199]** G. Sdoukopoulou, M. Antonakakis, G. Modde, C. Wolters, M. Zervakis, “Interictal Spike Classification in Pharmacoresistant Epilepsy using Combined EEG and MEG”, IEEE 21st International Conference on Bioinformatics and Bioengineering (IEEE BIBE), Oct. 2021

**[200]** M. Antonakakis, K. Politof, G. Klados, G. Sdoukopoulou, S. Schiza, M. Panadogiorgaki, C. Farmaki, M. Padiaditis, M. Zervakis, V. Sakkalis, “Heart Rate Classification Using ECG Signal Processing and Machine Learning”, IEEE 21st International Conference on Bioinformatics and Bioengineering (IEEE BIBE), Oct. 2021, Kragujevac, Servia. **(Best Paper Award - 1st place)**

**[201]** T. Zacheilas, K. Moirogiorgou, N. Papandroulakis, E. Sotiriades, M. Zervakis, A. Dollas, “An FPGA-Based System for Video Processing to Detect Holes in Aquaculture Nets”, IEEE 21st International Conference on Bioinformatics and Bioengineering (IEEE BIBE), Oct. 2021

**[202]** M. Papadogiorgaki, M. Venianaki, P. Charonyktakis, M. Antonakakis, I. Tsamardinos, M. Zervakis, V. Sakkalis, “Heart Rate Classification Using ECG Signal Processing and Machine Learning Methods”, IEEE 21st International Conference on Bioinformatics and Bioengineering (IEEE BIBE), Oct. 2021, Kragujevac, Servia

**[203]** GA Klados, K Politof, ES Bei, K Moirogiorgou, N Anousakis-Vlachochristou, GK Matsopoulos, M Zervakis, “Machine Learning Model for Predicting CVD Risk on NHANES Data”, 43rd Intl Conf. of the IEEE Engineering in Medicine & Biology Society (IEEE EMBC), Oct 31 - Nov

4, 2021. Virtual Conference <https://doi.org/10.1109/EMBC46164.2021.9630119>

**[204]** Aikaterini Tsellou, Konstantia Moirogiorgou, Georgios Plokamakis, George Livanos, Kostas Kalaitzakis, Michalis Zervakis, “Aerial video inspection of Greek power lines structures using machine learning techniques”, 2022 IEEE International Conference on Imaging Systems and Techniques (IEEE IST), Virtual Conference | June 21-23 2022.

**[205]** Konstantia Moirogiorgou, Freiderikos Raptopoulos, George Livanos, Stavros Orfanoudakis, Maria Papadogiorgaki, Michalis Zervakis, Michail Maniadakis, “Intelligent robotic system for urban waste recycling”, 2022 IEEE International Conference on Imaging Systems and Techniques (IEEE IST), Virtual Conference | June 21-23 2022.

**[206]** M Antonakakis, K Tsakos, A Tzavaras, E.G Spanakis, V Sakkalis, E Petrakis, M Zervakis (2022). Real-Time Object Detection using an Ultra-High-Resolution Camera on Embedded Systems. 2022 Annual Int. Conf. on Imaging Systems and Techniques (IEEE IST), Kaohsiung, Taiwan

**[207]** A Karasmanoglou, M Antonakakis, M Zervakis. Towards a heatmap-based explanation of YOLOv5 object detection results with Layer-wise Relevance Propagation (2022). Annual Int. Conf. on Imaging Systems and Techniques (IEEE IST), Kaohsiung, Taiwan

**[208]** M Antonakakis, SI Dimitriadis, M Zervakis, AC Papanicolaou and G Zouridakis (2022). Characterization of mild Traumatic Brain Injuries with Network Microstates of Dominant Functional Connectivity from MEG-based Beamformed Connectivity Analysis. 22nd Int. Conf. on Biomagnetism (Biomag2022), Birmingham, UK

**[209]** K Politof, M Antonakakis, SI Dimitriadis, M Zervakis, and G Zouridakis (2022). Characterization of Mild Traumatic Brain Injury using Finite Element Head Modeling and Fused EEG/MEG Source Connectivity Analysis .22nd Int. Conf. on Biomagnetism (Biomag2022), Birmingham, UK

**[210]** C. Farmaki, M. Padiaditis, M. Papadogiorgaki, E. G. Spanakis, M. Zervakis, S. Schiza, N. Tzanakis, E. Galanakis and V. Sakkalis, “Contactless Sleep Monitoring in a Real-Life Clinical Environment”, 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'22), July 11-15, 2022, Glasgow, UK.

**[211]** A. Grammatikopoulou, N. Grammalidis, M. Papadogiorgaki, M. E. Zervakis, “A platform for health emergency warning and wandering behaviour detection supporting people with Intellectual Disability”, International Conference on PErvasive Technologies Related to Assistive Environments (PETRA 2022), Workshop on QUality of LiFE Support SysTEm for People sufferIng from COgNitive impairments or Intellectual Disabilities (QUESTION), June 29-July 1, 2022, Corfu, Greece.

**[212]** G Torakis, M Antonakakis, E Bei, M Zervakis (2022). Design of a multi-feature classification scheme for infant epileptic seizures. IEEE BIBE 2022, Taichung, Taiwan.

**[213]** A Karasmanoglou, M Antonakakis, M Zervakis (2022). Monitoring short-time novelty of Electrocardiogram signals for epileptic seizure anticipation using Unsupervised Anomaly Detection. IEEE BHI-BSN 2022, Ioannina, Greece.

**[214]** Tsakaneli, S., Bei E.S., Zervakis, M.E. (2022). A 21-hub-gene Signature in Multiple Sclerosis

Identified using Machine Learning Techniques. IEEE International Conference on Biomedical and Health Informatics (IEEE BHI-BSN'22), Ioannina Greece, 27-30 September 2022.

### **FUNDED RESEARCH PROJECTS**

- [1]** 2022-2023 Δίκτυο Ανάδειξης Υποστήριξης και Προώθησης Ερευνητικής Καινοτομίας Νησιωτικής Ελλάδας (GNQSI)  
TUC University Proposal  
Funding Agency: Ministry of Development and Investments, Action: Entrepreneurship and Innovation 2014-2020»  
TUC budget 290.000,00 € Euro
- [2]** 2022-2024 European Digital Innovation Hub for Smart Health: Precision Medicine and Innovative E-health Services (smartHealth); Leader of ECE team for TUC  
Funding Agency: European Commission European Digital Innovation Hub, DIGITAL-2021-EDIH-01  
ECE-TUC budget 109.675,00 € Euro (50% funding)
- [3]** 2021-2024 RE-EURECA-PRO – REsearch and innovation dimension of the European University on Responsible Consumption And PROduction; Leader of ECE team for TUC  
Funding Agency: European Commission Horizon 2020; IBA-SwafS-Support-2-2020  
ECE-TUC budget 261.875.00 Euro
- [4]** 2020-2023 BorderUAS - Semi-autonomous border surveillance platform combining next generation unmanned aerial vehicles with ultra-high-resolution multi-sensor surveillance payload; Leader of ECE team for TUC  
Funding Agency: European Commission Horizon 2020; BES-2-2019  
ECE-TUC budget 735.625 Euro
- [5]** 2020-2023 Quality of Life Support System for persons with Mental Inabilities– QuaLiSID  
Leader of ECE team for TUC  
Funding Agency: Ministry of Education Research and Religious Affairs, Action: Research-Create-Innovate 2<sup>nd</sup> Cycle  
ECE-TUC budget 312.000 Euro
- [6]** 2020-2023 Automated Inspection from Aerial Video View of the Greek power lines network - AdvISer' Leader of ECE team for TUC  
Funding Agency: Ministry of Education Research and Religious Affairs, Action: Research-Create-Innovate 2<sup>nd</sup> Cycle  
ECE-TUC budget 300.000 Euro
- [7]** 2019-2022 Automatic detection and localization of High frequency Oscillation in Paediatric Epilepsy (HOPE) ; Leader of ECE team for TUC  
Funding Agency: H2020- Marie Skłodowska-Curie Actions Research and Innovation Staff Exchange (RISE)  
ECE-TUC budget 68.000 Euro

- [8]** 2018-2021 Application of Smart Systems for enhanced fish management and welfare in cage aquaculture (iFish) ; Leader of ECE team for TUC  
Funding Agency: Ministry of Rural Development and Food, Action: Innovation in Fisheries  
ECE-TUC budget 129.000 Euro
- [9]** 2018-2021 Standard Services of Medical Assessment, prevention and Stratification of Recruits in Armed Forces and Evaluation of Health Indicators (eMASS) ; Leader of ECE team  
Funding Agency: Ministry of Education Research and Religious Affairs, Action: Research-Create-Innovate  
ECE-TUC budget 199.570 Euro
- [10]** 2018-2021 Advanced Monitoring System for Infants (xBΛEΨΙΣ) ; Leader of ECE team for TUC  
Funding Agency: Ministry of Education Research and Religious Affairs, Action: Research-Create-Innovate  
ECE-TUC budget 79.210 Euro
- [11]** 2018-2021 Autonomous robotic system for urban waste recycling (ANAΣA) ; Leader of ECE team for TUC  
Funding Agency: Ministry of Education Research and Religious Affairs, Action: Research-Create-Innovate  
ECE-TUC budget 192.640 Euro
- [12]** 2018-2021 sMart fArming with dRoneS (MARS) ; Leader of ECE team for TUC  
Funding Agency: Ministry of Education Research and Religious Affairs, Action: Research-Create-Innovate  
ECE-TUC budget 169.500 Euro
- [13]** 2012-2015 High-Frequency Monitoring System for Integrated Water Resources Management of Rivers (CyberSensors); Leader of ECE team for TUC  
Funding Agency: GSRT-Thales Programme.  
ECE-TUC budget 195.000 Euro
- [14]** 2013-2015 FI-STAR: Future Internet Social and Technological Alignment Research; Investigator for TUC  
Funding Agency: SEVENTH FRAMEWORK PROGRAMME, FP7-ICT  
TUC budget 598,676 Euro
- [15]** 2012-2015 AI-CARE: Advanced Knowledge Management Systems with Inherent Computational Intelligence and Applications in Health Care; Investigator for TUC  
Funding Agency: NATIONAL PROGRAMMES  
TUC budget 126.000 Euro
- [16]** 2012-2015 eTRAWELSPA: e-TRAINING FOR WELLNESS IN SPA SERVICES; Principal investigator for TUC and TSI  
Funding Agency: LDV-Life Long Learning (LLP-LdV-ToI-2011-RO-022)  
TUC-TSI budget 52.000 Euro

- [17]** 2011-2013 YPERTHEN; Principal investigator for TUC  
Funding Agency: INTERREG Greece-Cyprus.  
TUC budget 360.000 Euro
- [18]** 2011-2015 OncoSeed; Principal investigator for TUC  
Funding Agency: GSRT-Collaboration Programme.  
TUC budget 95.000 Euro
- [19]** 2011-2013 OASYS; Principal investigator for TUC  
Funding Agency: GSRT-Collaboration Programme.  
TUC budget 90.000 Euro
- [20]** 2011-2013 Real Time Simulation for Safer vascular Stenting (RT3S) ; Principal investigator  
Funding Agency: FP7-ICT Project N° 248801.  
TUC budget 372.000 Euro
- [21]** 2010-2011 ΣYN-EEG; Principal investigator for TUC  
Funding Agency: TUC Basic Research.  
TUC budget 15.000 Euro
- [22]** 2008-2011 Curricula Reformation & Harmonisation in the Field of Biomedical Engineering (CRH-BME Project N° 144537-TEMPUS-2008-GR-JPCR); Principal investigator for TUC  
Funding Agency: TEMPUS IV.  
TUC budget 36.000 Euro
- [23]** 2006-2008 Getting Cretan Businesses On-Line and Doing E-Business (eKONES); Principal investigator for TUC  
Funding Agency: Ministry of Development, General Secretariat for Research and Tech.  
TUC budget 30.000 Euro
- [24]** 2006-2008 Meta-Genomic Methods and Technologies for Diagnosis and Therapy Selection: Analysis of Genotype and Molecular Markers (GONOTYPOS); Principal investigator for TUC  
Funding Agency: Ministry of Development, General Secretariat for Research and Technology.  
Total budget 871.000 euros, TUC budget 100.000 Euro
- [25]** 2006-2008 Integrated Inspection System supported by Automated Motion Detection; Co-Principal investigator for TUC  
Funding Agency: Ministry of Development, General Secretariat for Research and Technology  
Total budget 800.000 Euros, TUC Budget 244,402 Euro
- [26]** 2006 District Technology Platform for Wideband Health Services; Principal Inv. TUC  
Funding Agency: District of Crete under the Programme "Poles of Innovation"
- [27]** 2005-2008 TOWL: Time-determined ontology based information system for real time stock; Partner (co- leader of TUC team)

- Source: STREP IST, FP6  
Funding: 1.96 Mecu (244,402 Euro for TUC)
- [28]** 2004-2008      Computational Intelligence for biopattern analysis in Support of eHealthcare (BIOPATTERN); Principal investigator for TUC  
Source: IST  
Funding: 6.4 Mecu, (320,000 Euro for TUC)
- [29]** 2005-2007      Training Centre for Health Care, Prophylactic and Rehabilitation Services  
Source: LEONARDO DA VINCI Community Vocational Training Action, 2nd phase  
Participation: Partner (scientific leader of TUC team)  
Funding: 198 Kecu, (46,000 Euro for TUC)
- [30]** 2004-2007      Improving airport Efficiency, Security and Passenger Flow by Enhanced Passenger Monitoring (OPTAG)  
Source: Aeronautics and Space  
Participation: Partner (scientific leader of TUC team)  
Funding: 1.5 Mecu, (270.000 Euro for TUC)
- [31]** 1998-2001      High Performance Industrial Vision (HIPER)  
Source: BRITE-EURAM III  
Participation: Partner (scientific leader of TUC team)  
Funding: 4.5 Mecu
- [32]** 1998-2001      Advanced Tomographic Sensors for Industrial Multiphase Imaging  
Source: Thematic Network, BRITE-EURAM III  
Participation: Partner  
Funding: 460 Kecu
- [33]** 11/98-10/2000    Dissemination of Advanced Control Technologies for Isolated Power Systems with Increased Renewable Energy Sources Penetration  
Source: THERMIE B  
Participation: Collaborator  
Funding: 125 Kecu
- [34]** 7/97-12/99      Interdisciplinary Programme for Technology Development and Technology Transfer to the Local Market  
Source: Dept of Education, EPEAEK, Action 3.1.α.  
Participation: Coordinator
- [35]** 7/97-12/99      Master's Programme in the area of Technology Development  
Source: Dept of Education, EPEAEK, Action 3.2.α.  
Participation: Coordinator
- [36]** 1/96-12/99      Quality Control for House-hold Appliances by On-Line Evaluation of Mechanical Defects (MEDEA)  
Source: SMT4, Standard Measurement and Testing Programme  
Participation: Partner

- [37] 1/1/96-31/12/97 Development of an Automated Robotic System with applications in biomedical Operations  
Source: Distinct of Crete, Development fund
- [38] 7/01/94-10/30/94 Development of a Weather Information System  
Source: Minnesota, Department of Transportation (MN-DoT)  
Participation: Principal Investigator  
Funding: 25.000 USD
- [39] 6/01/94-9/01/94 Characterization of Contaminants in Waste Paper Bales Based on Physical Characteristics of Contaminants  
Source: Superior Recycled Fiber Industries (SRFI) of Minnesota  
Participation: Principal Investigator  
Funding: 36.000 USD
- [40] 12/16/93-12/15/94 Robust Algorithms for Image Compression and Expansion  
Source: University of Minnesota, under the program Grant-in-Aid Awards  
Participation: Principal Investigator  
Funding: 11.880 USD
- [41] 5/25/93-9/30/93 Wastepaper Classification and Processing  
Source: Superior Recycled Fiber Industries (SRFI) of Minnesota  
Participation: Principal Investigator  
Funding: 71.500 USD
- [42] 9/1/92-1/31/93 Nonstationary Restoration of Multiframe Images  
Source: AUG Signals Ltd., Ontario, Canada  
Participation: Principal Investigator
- [43] 7/16/93-8/30/93 Robust Modeling and Restoration of Multichannel Images  
Source: University of Minnesota, under the program Faculty Summer Research Fell  
Participation: Principal Investigator
- [44] 7/01/91-6/30/92 Regularized Reconstruction of Biomedical Images from Limited Views  
Source: University of Minnesota, under the program Grant-in-Aid Awards  
Participation: Principal Investigator
- [45] 6/11/91-7/16/91 Constrained Mean-Square Algorithms in Color Image Restoration  
Source: University of Minnesota, under the program Faculty Summer Research Fell  
Participation: Principal Investigator

#### **DISTINCTIONS IN INTERNATIONAL ACADEMICS**

- Organizing Committee member, The 22nd IEEE International Conference on BioInformatics and BioEngineering (IEEE BIBE 2022), Taiwan <https://bibe2022.asia.edu.tw/>
- Honorary Co-Chair, IEEE International Conference on Imaging Systems and Techniques (IEEE IST 2022), Taiwan, <https://ist2022.ieee-ims.org/>



- Special Session Organizer: M Antonakakis and M Zervakis. Biomedical image and signal methods and applications for analysing human abnormal body responses (2022). IEEE BHI-BSN 2022, [https://bhi-bsn-2022.org/?page\\_id=3212](https://bhi-bsn-2022.org/?page_id=3212)
- Special Issue Editor: M Zervakis and M Antonakakis (2022). MDPI – Sensors (Impact factor: 3.847). Special Issue “Advances on UAV-based Sensing & Imaging.” [https://www.mdpi.com/journal/sensors/special\\_issues/UAV\\_SI](https://www.mdpi.com/journal/sensors/special_issues/UAV_SI)
- Programme Committee member and a Bioengineering section co-chair, IEEE Sponsored “Digital Signal Processing and its Applications — DSPA-2022”, <http://dspa-conf.org/pages/home>
- Programme Committee member and a Bioengineering section co-chair, IEEE Sponsored “Digital Signal Processing and its Applications — DSPA-2021”, <http://dspa-conf.org/pages/home>
- Honorary Co-Chair, IEEE Imaging Systems and Techniques (IST) 2021, virtual conference New York USA, Aug. 24-26, 2021 <https://ist2021.ieee-ims.org/committees/>
- Honorary co-Chair, Advisory Committee member, 2019 IEEE Intl Conference on Imaging Systems and Techniques, Dec. 8-10 Abu Dhabi, UAE, <https://ist2019.ieee-ims.org/>
- Honorary Chair, Advisory Committee member, 2018 IEEE Intl Conference on Imaging Systems and Techniques, Oct. 16-18 Krakow, Poland, <http://ist2018.ieee-ims.org/>
- Guest Editorial IEEE BHI 2017 Liang, J., Zervakis, M., Penders, J., 2018 IEEE Journal of Biomedical and Health Informatics, 22(2), pp. 300
- Guest Editorial Multimedia Systems for Critical Engineering, A. Doulamis, G. Giakos, E. Petrakis, M. Zervakis, 2018 Springer: Multimedia Tools and Applications, 77(8), pp. 9209-9209
- Guest Editorial Special session on imaging systems and techniques 2016, Giakos, G., Yang, W., Zervakis, M., Xu, L., Measurement Science and Technology, 29(5), 2018
- Honorary Chair, Steering Committee member, International Technical Committee member, 2017 IEEE Intl Conference on Imaging Systems and Techniques, Oct. 18-20 Beijing, China, <http://ist2017.ieee-ims.org/>
- Technical Program Committee member, IEEE Intl Conference on Biomedical and Health Informatics, <http://bhi.embs.org/2017/>
- Guest Editor, IEEE Journal of Biomedical and Health Informatics, Special Issue on “Informatics for personalized, precision and preventive Healthcare (3P Healthcare)”, 2017
- Guest Editor, Journal of Biomedical Signal Processing and Control, Special Issue on “Biomedical Imaging Systems”, 2017 <https://www.journals.elsevier.com/biomedical-signal-processing-and-control/call-for-papers/special-issue-on-biomedical-imaging-systems>
- Guest Editor, Journal Multimedia Tools and Applications, Special Issue on “Multimedia Systems for Critical Engineering Applications”, 2017 <http://static.springer.com/sgw/documents/1597858/application/pdf/Full+Call+Special+Issue+of+MTAP.pdf>
- Guest Editor, Measurement Science and Technology journal, Special Issue on “Imaging

- Systems and Techniques”, 2017 <http://iopscience.iop.org/journal/0957-0233>
- Local Chair, and Steering Committee member, 2016 IEEE Intl Conference on Imaging Systems and Techniques, Oct.4-5, Chania, Greece, <http://ist2016.ieee-ims.org/>
  - Co-Chair, and Steering Committee member, 2015 IEEE Intl Conference on Imaging Systems and Techniques, Sept.16-18 Macau, China, <http://ist2015.ieee-ims.org/>
  - Co-Chair, Steering and Local Committee member, 2014 IEEE Intl Conference on Imaging Systems and Techniques, Oct 14-17, Santorini, Greece, <http://ist2014.ieee-ims.org>
  - International Committee Chair, 13<sup>th</sup> IEEE Intl Conference on Bioinformatics and BioEngineering, Nov. 10-13, 2013, Chania, Greece  
<http://ieeexplore.ieee.org/xpl/mostRecentIssue.jsp?punumber=6689795>
  - Co-Editor, “Data Mining for Biomarker Discovery” Edited by Panos M. Pardalos, Petros Xanthopoulos and Michalis Zervakis, Springer Optimization and Its Applications Volume 65, 2012, DOI: [10.1007/978-1-4614-2107-8](https://doi.org/10.1007/978-1-4614-2107-8)
  - General Chair, 14th IASTED Conference on Artificial Intelligence and Soft Computing, June 20-24,2011, Crete, Greece <http://www.iasted.org/conferences/home-716.html>
  - Organizing Committee, 10th International Workshop on Biomedical Engineering, 5-7 October 2011, Kos Greece <http://medlab.cc.uoi.gr/10thbioeng>
  - Invited Speaker at ACM PETRA 2011 ([www.petrae.org](http://www.petrae.org)), May 25-27 2011, Crete, Greece.
  - Organizing Committee, 6th European Symposium on Biomedical Engineering (IFMBE 2008), June 19 - 21, 2008, Chania, Greece
  - Organizing Committee, Intl Conf. on Imaging Systems and Techniques (IST 2008) September 10-12, 2008, Chania, Greece
  - Co-Organizer, International Conference on Biomedical Data & Knowledge Mining: Towards Biomarker Discovery, 7-9 July 2010, Chania, Greece
  - International Programme Committee and Session Chair: Intl Conf. on Imaging Systems and Techniques (IST-10), July 1-2, 2010, Thessaloniki, Greece
  - Session Chair: (ICANN-09), 14-17 September, Limassol, Cyprus
  - Special Session Organizer in ICANN-09: Data mining and modelling of brain activity- their use as tools for understanding attentional mechanisms
  - International Programme Committee and Session Chair: 9th International Conference on Information Technology and Applications in Biomedicine (ITAB 2009), November 5-7, 2009, Larnaca, Cyprus
  - Session Chair: 8th IEEE International Conference on Bioinformatics and BioEngineering (BIBE 2008), October 8-10, 2008, Athens, Greece.
  - Organizing Committee, 6th European Symposium on Biomedical Engineering (IFMBE 2008), June 19 - 21, 2008, Chania, Greece
  - Organizing Committee, Intl Conf. on Imaging Systems and Techniques (IST 2008) September 10-12, 2008, Chania, Greece
  - Programme Committee Member and Session Chair: CIMED-07 (International Conference on Computational Intelligence in Medicine and Healthcare) , 24-27 July, 2007 Plymouth, UK

- Technical Committee Member: IEEE EMBC 2006 (Engineering in Medicine and Biology Conference), August 30-Sept. 3, 2006, New York City, USA
- Chairperson: Undergraduate Research Opportunities Program (UROP) committee, University of Minnesota, Duluth, for the academic year 1993-94.

## **RESEARCH AREAS**

**Michalis Zervakis** is serving as Professor at the School of Electronics and Computer Engineering and directs the Digital Image and Signal Processing Laboratory and the Laboratory of Automation at TUC. His research interests include modern aspects of signal and image processing, data mining and pattern recognition, imaging systems and integrated automation systems. Under his direction, his group is constantly aiming at strengthening its expertise and its recognition in the International research arena as a centre of excellence for research. This is achieved through collaborations with the industry and academia and its participation in high-caliber European and National funded research.

His research covers a wide range of design, analysis, architecture, implementation and validation fields. He and his team maintain long experience in many areas of R&D with particular strength in the following.

- Image / video processing and compression, Image / Video content analysis and description (e.g., motion analysis, shape analysis, object tracking),
- Design and analysis of surveillance systems; panoramic image generation; real-time implementation of integrated imaging systems on DSP boards
- Non-destructive inspection and monitoring; Image analysis methods for erosion/corrosion evaluation; Quantification of pollution effects on stone surfaces; Non-destructive vibration analysis of electric machines
- Information systems technology with emphasis on the management (processing, information extraction, dissemination and retrieval) of complex information.
- Pattern recognition, class discrimination and prediction, regression, stochastic and network modeling, feature extraction.
- Bioinformatics, biostatistics, biomedical signal analysis and medical imaging systems with applications in marker selection from mass genomic data, electro-encephalogram (EEG) analysis, time-frequency biosignal and EEG characterization, modeling of disease state and progression (diabetes, dementia , Alzheimer's disease), Cancer research on diagnosis & prognosis (breast, brain and ovarian cancer, leukemia).
- Graph theoretical aspects with applications in biological networks and biomarker interaction across cohort models, identification of clinical subtypes, progression models and comorbidity association networks, data visualization and presentation.

The DISPLAY lab [www.display.tuc.gr](http://www.display.tuc.gr) covers a wide range of analysis, architecture,

implementation and validation areas. Applications include bioinformatics, biosignal analysis and medical Imaging, biomarker selection from mass genomic data, time-frequency biosignal and EEG characterization, modeling of disease state and progression, as well as cancer research on diagnosis & prognosis. The Lab has extensive experience on issues of pattern recognition, machine learning, data and knowledge mining, applications in biomedical datasets, biostatistics, biomarker extraction and prediction, disease diagnosis and prognosis.

The Automation lab performs teaching and research on all major sectors of systems, such as computer and control systems, mechatronics and robotics, industrial informatics and systems biology. Particular areas of automation for the Lab include Computer Aided Design (CAD), Computer Aided Management (CAM), robotics, quality control, as well as integrated systems for factory automation with image processing tools, decision making algorithms and graphical user interfaces to simulate, design, and monitor complex processes.