

Georgios Tzedakis

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Research Interests

Systems Biology, Computational Oncology, Hybrid Modeling, Agent Based Models, Biomedical Informatics and Engineering, Numerical Algorithms, Machine Learning

Research Experience

Technical Staff | Computational BioMedicine Laboratory (CBML), Institute of Computer Science (ICS), FORTH | 01.10.2011 – onwards

Working as a scientific programmer for research grants with main interest the mathematical modeling and development of hybrid (discrete & continuous) models which aim to describe and predict tumor growth, the peritumoral environment and various therapy schemes.

Mandatory military service | Greek army | 11.2010 – 07.2011

Graduate research assistant | Telecommunications and Networks Laboratory (TNL), ICS, FORTH, Heraklion, Crete, Greece | 01.02.2009 – 31.10.2010

Worked as a M.Sc. research assistant, position was funded by a postgraduate scholarship. Developed thesis, optimization of voice signal coding algorithm of harmonic and sinusoidal models.

Undergraduate research assistant | Computer Architecture and VLSI Systems (CARV), ICS, FORTH, Heraklion, Crete, Greece | 01.10.2007 – 30.06.2008

Worked as an undergraduate student, position was funded by an undergraduate scholarship. Studied and developed lightweight storage driver for reading and writing encrypted data.

Education

MSc in Computer Science | 02.2008 – 11.2010 | Computer Science Department, University of Crete (UOC)

- MSc Thesis: “Fast Least-Squares Solution for Harmonic and Sinusoidal Models”
- Specializations: i) Multimedia Technologies, ii) Computer Vision & Robotics

BSc in Applied Mathematics | 09.2002 – 09.2007 | Department of Applied Mathematics, University of Crete (UOC)

- Specialization: Mathematical Methods and Software Development
- Degree: 7.12

Prizes and Awards

20.07.2014

- 2nd prize for the student project for modeling and simulation project: “Model of Cell Polarity in *C.elegans*”, during Dresden Summer School in Systems Biology

13.07.2011

- Diploma of honorary hoplite service awarded for performing with zeal and devotion the duties assigned during the military service and achieving excellent performance

Postgraduate fellowship, funded by TNL, ICS, FORTH | 01.02.2009 – 31.10.2010

Undergraduate fellowship, funded by CARV, UCS, FORTH | 01.10.2007 – 31.06.2008

Seminars/Summer schools

- Software Frameworks for Challenging Computational Problems Workshop | ACMAC center of University of Crete | 14-18/1/2013
- Dresden Summer School in Systems Biology | Center of Systems Biology Dresden and the International Max Planck Research School for Cell, Developmental and Systems Biology | 12-20/7/2014
- Successfully completed courses on Coursera platform:
 - Making Better Group Decisions: Voting, Judgement Aggregation and Fair Division, University of Maryland, College Park, 2014
 - Model Thinking, University of Michigan, 2015
 - Programming for Everybody (Getting Started with Python), University of Michigan, 2016
 - Python Data Structures, University of Michigan, 2016
 - Machine Learning, Stanford University, 2017
 - Data Science Math Skills, Duke University, 2017
 - Learning How to Learn: Powerful mental tools to help you master tough subjects, McMaster University & University of California San Diego, 2018

Selected publications

13 articles in international refereed journals and articles in peer-reviewed conference proceedings. **h-Index: 5, Citations: 62**

- Tzamali E., **Tzedakis G.**, and Sakkalis V., “Modeling How Heterogeneity in Cell Cycle Length Affects Cancer Cell Growth Dynamics in Response to Treatment”, *Frontiers in Oncology*, 2020
- Tzamali E., **Tzedakis G.**, and Sakkalis V., “A framework linking glycolytic metabolic capabilities and tumor dynamics”, *IEEE Journal of Biomedical and Health Informatics*, 2019
- Oraiopoulou M.E., Tzamali E., **Tzedakis G.**, Liapis E, Zacharakis G, Vakis A, Papamatheakis J, Sakkalis V , “Integrating *in vitro* experiments with *in silico* approaches for Glioblastoma invasion: the role of cell-to-cell adhesion heterogeneity”, *Nature Scientific Reports*, 2018, 8(1): p. 16200
- Oraiopoulou M.E., Tzamali E., **Tzedakis G.**, Vakis A., Papamatheakis J., and Sakkalis V., “*In Vitro/In Silico* Study on the Role of Doubling Time Heterogeneity among Primary Glioblastoma Cell Lines”, *BioMed Research International*, 2017
- **Tzedakis G.**, Liapis E., Tzamali E., Zacharakis G., & Sakkalis V. “A hybrid discrete-continuous model of in vitro spheroid tumor growth and drug response”, 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 2016
- **Tzedakis G.**, Tzamali E., Marias, K. & Sakkalis, V. “The importance of neighborhood scheme selection in agent-based tumor growth modeling”, *Cancer Informatics*, 2015
- E. Tzamali, **G. Tzedakis**, K. Marias, G. Zacharakis, A. Zacharopoulos, and V. Sakkalis “Simulating cancer behavior based on in silico modeling and in vivo molecular imaging approaches: Prospects and limitations”, *IEEE International Conference on Imaging Systems & Techniques (IST)*, Santorini, Greece, October 14-17, 2014

- **G. Tzedakis**, G. Grekas, E. Tzamali, K. Marias, & V. Sakkalis (2014). "The importance of grid size and boundary conditions in discrete tumour growth modeling". *Advanced Research Workshop on In Silico Oncology and Cancer Investigation - The TUMOR Project Workshop (IARWISOCI), 2014 6th International. IEEE; 2014:1-4.*
- E. Tzamali, R. Favicchio, A. Roniotis, **G. Tzedakis**, G. Grekas, J. Ripoll, K. Marias, G. Zacharakis, and V. Sakkalis, "Employing in-vivo Molecular Imaging in Simulating and Validating Tumor Growth", *35th IEEE-EMBS, Engineering in Medicine and Biology Society (EMBC 2013).*
- A. Roniotis, V. Sakkalis, E. Tzamali, **G. Tzedakis**, M. E. Zervakis, & K. Marias (2012). "Solving the PIHNA model while accounting for radiotherapy", *5th International Advanced Research Workshop on In Silico Oncology and Cancer Investigation, Athens, Greece, October 22-23, 2012.*
- **Tzedakis G.**, Pantazis Y., Rosec O. & Stylianou Y., "Fast least-squares solution for sinusoidal, harmonic and quasi-harmonic models", INTERSPEECH 2010

Poster presentations

- M.E. Oraiopoulou, E. Tzamali, **G. Tzedakis**, E. Liapis, G. Zacharakis, A. Vakis, V. Sakkalis, J. Papamatheakis "Unforeseen invasive morphology observed in primary Glioblastoma cell line spheroids", Chemical Biology of Disease Meeting, Heraklion, Greece, 2017

Skills

Computer

Programming: Matlab, C, Python, Fortran, C++ | Libraries: LaTeX, LAPACK, MPI, TensorFlow

Languages

Greek (Native), English (Full professional proficiency)

Teaching

- **Teaching assistant at Computer Science Department, University of Crete**
Calculus 2 (summer semesters 2009-2010, 2008-2009)
Applied mathematics for engineers (winter semester 2009-2010)
Discrete mathematics (winter semesters 2008-2009, 2007-08)
- **Teaching assistant at Applied Mathematics Department, University of Crete**
Introduction to computer systems (winter semester 2007-08)
Discrete mathematics (winter 2006-07)
Introduction to numerical algorithms (summer semesters 2005-06, 2004-05)