

GEORGIOS KARPETAS

Curriculum Vitae

Personal Information

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Current Position

Laboratory Teaching Staff, Medical Physics & Medical Informatics,
Faculty of Medicine, School of Health Sciences, University of Thessaly, Biopolis, 41500
Larissa, Greece

Degrees

(2001) Bachelor of Science in Electrical and Computer Engineering, Aristotle University of Thessaloniki (AUTH), Greece

(2016) Bachelor of Science in Economics, University of Macedonia, Greece

(2004) Master (MSc) in Medical Informatics, Aristotle University of Thessaloniki (AUTH), Greece

(2013) Doctorate (PhD) in Medical Physics, University of Patras, Greece

Job positions: Laboratory Teaching Staff in the School of Health Sciences, Faculty of Medicine (University of Thessaly), Laboratory of Medical Physics and Laboratory of Medical Informatics.

Languages

Greek (native), English (Proficiency)

Research Posts

Experience in projects co-financed by Greece and the European Union (NSRF 2007-2013, European Social Fund)

- Development of Monte Carlo simulation tool for evaluation of nano-phosphor based X-ray imaging detectors, funded by European Union-Greek Ministry of Education, under the Research program ARCHIMIDIS III (P.I. Prof. Ioannis Kandarakis).
- Reviewer in BIOMEPP 2017, Department of Biomedical Engineering of TEI of Athens
- Reviewer in Scientific Journals, [European Radiology](#)
- Experience in software development and expert in the field image reconstruction and Monte Carlo modelling
- Collaborate with the Dual energy research team in previous projects and publications as well as in the field of nuclear medicine detectors evaluation through novel medical imaging evaluation protocols
- Participation with research team in medical imaging in the Departments of Medicine, Electrical and Computer Engineering, and Informatics, of Aristotle University of Thessaloniki and receive grants from State Scholarships Foundation (IKY) over the years 2003 and 2004, specializing in image processing from the Intravascular Ultrasound (IVUS).
- Participation with research team of the University of Patras and Department of Biomedical Engineering of TEI of Athens (Biomedical Engineering Department, University of West Attica) over the year 2006 until 2019 at:

- Monte Carlo simulation with Gate, which is advanced opensource software and it is dedicated to numerical simulations in medical imaging and radiotherapy.
- Support simulations of Emission Tomography (Positron Emission Tomography - PET and Single Photon Emission Computed Tomography - SPECT), Computed Tomography (CT), Optical Imaging (Bioluminescence and Fluorescence) and Radiotherapy experiments.
- Experimental measurements with collaborations in various Greek hospitals such as Evangelismos Hospital and University Hospital of Larissa.

Teaching Experience

- 1) Faculty of Medicine, School of Health Sciences, Laboratory of Medical Physics & Medical Informatics (2017-2019).
 - Medical Physics
 - Medical Informatics I
 - Medical Informatics II
 - Radiation Protection
- 2) Teacher of Secondary and Technological Education, Ministry of National Education & Religious Affairs, Organisation for Vocational Education and Training (O.E.E.K.), Public Institute of Professional Training (I.E.K) (2004-2017)

Teaching (Master Courses)

- 1) International Interdepartmental postgraduate program in Medical Physics. University of Patras Schools of Health Science Faculties of Medicine-Physics (2018-2019).
- 2) Departmental postgraduate program in Advanced Systems and Methods in Biomedical Engineering. Department of Biomedical Engineering, University of West Attica. (2019-2020).

Collaborations

- 1) [Laboratory of Radiation Physics, Materials Technology and Biomedical Imaging, AKTYBA](#) (Director: Professor G. Fountos)
- 2) [Laboratory of Medical Physics, Medical Physic](#) (Director: Professor G. Panayiotakis)

Scholarships

Scholar of the [Greek State Scholarships Foundation \(I.K.Y.\)](#) for Academic Years 2003-2004 on the ‘Biomedical Technology’ specialty after succeeding in the exams of the Foundation.

Peer-Reviewed Publications

Publications in International Scientific Journals

- 1) **G. E. Karpetas**, C. M. Michail, G. P. Fountos, P. N. Valsamaki, I. S. Kandarakis, G. S. Panayiotakis, (2013) [Towards the optimization of nuclear medicine procedures for better spatial resolution, sensitivity, scan image quality and quantitation measurements by using a new Monte Carlo model featuring PET imaging](#), *Hell J Nucl Med.* 16(2) :111-120. doi: 10.1967/s002449910082
- 2) **George E. Karpetas**, Christos M. Michail, George P. Fountos, Ioannis S. Kandarakis and George S. Panayiotakis, [A new PET resolution measurement method through Monte Carlo simulations](#), (2014) *Nucl. Med. Commun.* 35(9):967-976. doi:10.1097/MNM.0000000000000151
- 3) **G E Karpetas**, C M Michail, G P Fountos, N I Kalyvas, I G Valais, I S Kandarakis, G S Panayiotakis, [A Novel Method for the Image Quality assessment of PET Scanners by Monte Carlo simulations: Effect of the scintillator](#), (2014) *J. Phys.: Conf. Ser.* 490 012139. doi: [10.1088/1742-6596/490/1/012139](#)
- 4) D. Nikolopoulos, C. Michail, I. Valais, P. Yannakopoulos, S. Kottou, **G. Karpetas**, G. Panayiotakis, [GATE Simulation of the Biograph 2 PET/CT Scanner](#), (2014) *J. Nucl. Med. Radiat. Ther.* 5:201. doi:10.4172/2155-9619.1000201.

- 5) C M Michail, **G E Karpetas**, G P Fountos, N I Kalyvas, Niki Martini, Vaia Koukou, I G Valais and I S Kandarakis, [Medical Imaging Image Quality Assessment with Monte Carlo Methods](#) (2015) *J. Phys.: Conf. Ser.* 633 012096. doi: [10.1088/1742-6596/633/1/012096](https://doi.org/10.1088/1742-6596/633/1/012096)
- 6) **G E Karpetas**, C M Michail, G P Fountos, I G Valais, D Nikolopoulos, I S Kandarakis and G S Panayiotakis, [Influence of Iterative Reconstruction Algorithms on PET Image Resolution](#), (2015) *J. Phys.: Conf. Ser.* 637 012011. doi: [10.1088/1742-6596/637/1/012011](https://doi.org/10.1088/1742-6596/637/1/012011)
- 7) C M Michail, **G E Karpetas**, G P Fountos, I G Valais, D Nikolopoulos, I S Kandarakis and G S Panayiotakis, [Assessment of the Contrast to Noise Ratio in PET Scanners with Monte Carlo Methods](#), (2015) *J. Phys.: Conf. Ser.* 637 012019. doi: [10.1088/1742-6596/637/1/012019](https://doi.org/10.1088/1742-6596/637/1/012019),
- 8) C. M. Michail, **G. E. Karpetas**, G. P. Fountos, N. I. Kalyvas, I. G. Valais, C. Fountzoula, A. Zanglis, I. S. Kandarakis, G. S. Panayiotakis (2016) [A novel method for the Optimization of Positron Emission Tomography Scanners Imaging Performance](#), *Hell. J. Nucl. Med.* 19(3).231-240. doi: 10.1967/s002449910405
- 9) **George E. Karpetas**, Christos M. Michail, George P. Fountos, Nektarios I. Kalyvas, Ioannis G. Valais, Ioannis S. Kandarakis and George S. Panayiotakis (2017) [Detective Quantum Efficiency \(DQE\) in PET Scanners: A Simulation Study](#) *Appl. Radiat. Isot.* 125:154-162. doi: [10.1016/j.apradiso.2017.04.018](https://doi.org/10.1016/j.apradiso.2017.04.018)
- 10) Christos Michail, **George Karpetas**, Nektarios Kalyvas, Ioannis Valais, Ioannis Kandarakis, Kyriakos Agavanakis, George Panayiotakis and George Fountos, [Information Capacity of Positron Emission Tomography Scanners](#), (2018) *Crystals* 8(12): 459. doi: [10.3390/cryst8120459](https://doi.org/10.3390/cryst8120459)
- 11) Christos M. Michail, Kyriakos N. Agavanakis, **George. E.Karpetas**, Nektarios I. Kalyvas, Ioannis G. Valais, Ioannis S. Kandarakis, George S. Panayiotakis, George P. Fountos, [Information Content in Nuclear Medicine Imaging](#), (2019), *Energy Procedia*, 157:1517-1524. doi: [10.1016/j.egypro.2018.11.317](https://doi.org/10.1016/j.egypro.2018.11.317)
- 12) Saatsakis, G. Kalyvas, N. Michail, C. Ninos, K. Bakas, A. Fountzoula, C. Sianoudis, I. **Karpetas, G.E.** Fountos, G. Kandarakis, I. Valais, I. Panayiotakis, G. [Optical Characteristics of ZnCuInS/ZnS \(Core/Shell\) Nanocrystal Flexible Films Under X-Ray Excitation](#). *Crystals* (2019), 9, 343, <https://doi.org/10.3390/cryst9070343>
- 13) Kyriakos N. Agavanakis, **George. E. Karpetas**, Michael Taylor, Evangelia Pappa, Christos M. Michail, John Filos, Varvara Trachana and Lamprini Kontopoulou, [Practical machine learning based on cloud computing resources](#), *AIP Conference Proceedings* (2019), 2123, 020096, <https://doi.org/10.1063/1.5117023>.

Publications in International Scientific Conferences with Referees

- 1) **G. Karpetas**, C. Michail, A. Samartzis, G. Fountos, G. Loudos, I. Kandarakis and G. Panayiotakis, [Simulating the imaging performance of PET scanner using the Gate Monte Carlo toolkit](#), 4th International Conference on Experiments/Process/System Modeling/Simulation & Optimization, 4th IC-EpsMsO, 6-9 July, 2011.
- 2) **G Karpetas**, C Michail, G Fountos, N Kalyvas, I Valais, I Kandarakis, G Panayiotakis, [A Novel Method for the Image Quality assessment of PET Scanners by Monte Carlo simulations: Effect of the scintillator](#), International Conference on Mathematical Modeling in Physical Sciences September 1-5, 2013 Prague, Czech Republic.

Abstracts in International Scientific Conferences

- 1) **George. E. Karpetas**, Christos M. Michail, George P. Fountos, Nektarios I. Kalyvas, Ioannis G. Valais, Ioannis S. Kandarakis and George S. Panayiotakis, the effect of the scintillating crystal on pet imaging, [2nd Workshop on Bio-Medical Instrumentation and related Engineering And Physical Sciences](#), 21 and 22 June 2013, Athens, Greece.
- 2) **George. E. Karpetas**, Christos M. Michail, George P. Fountos, Nektarios I. Kalyvas, Ioannis S. Kandarakis and George S. Panayiotakis, the effect of iterative image reconstruction on PET imaging, [2nd Workshop on Bio-Medical Instrumentation and related Engineering And Physical Sciences](#), 21 and 22 June 2013, Athens, Greece.
- 3) Christos Michail, **George Karpetas**, George Fountos, Nektarios Kalyvas, Niki Martini, Vaia Koukou, Ioannis Valais, Ioannis Kandarakis [Medical Imaging Image Quality Assessment with Monte Carlo Methods](#), 4th International Conference on Mathematical Modeling in Physical Sciences, June 5-8, 2015, Mykonos, Greece.
- 4) Christos M. Michail, **George E. Karpetas**, George P. Fountos, Nektarios I. Kalyvas, Ioannis G. Valais, Dimitrios Nikolopoulos, Ioannis S. Kandarakis and George S. Panayiotakis, Assessment of the contrast to noise ratio (CNR) in positron emission tomography scanners with monte carlo methods, [Conference on Bio-Medical Instrumentation and related Engineering and Physical Sciences \(BIOMEPEP 2015\)](#), June 18-20, 2015, Athens, Greece

- 5) **George E. Karpetas**, Christos M. Michail, George P. Fountos, Nektarios I. Kalyvas, Ioannis G. Valais, Dimitrios Nikolopoulos, Ioannis S. Kandarakis and George S. Panayiotakis, Influence of iterative reconstruction algorithms on pet image resolution, [Conference on Bio-Medical Instrumentation and related Engineering and Physical Sciences \(BIOMEIP 2015\), June 18-20, 2015, Athens, Greece](#)
- 6) Christos M. Michail, Kyriakos N Agavanakis, **George. E. Karpetas**, Nektarios I. Kalyvas, Ioannis G. Valais, Ioannis S. Kandarakis, George S. Panayiotakis, George P. Fountos, Information Content in PET imaging, [Technologies and Materials for Renewable Energy, Environment and Sustainability TMREE18 Int'l Conf. Athens-Greece/September 19-21, 2018.](#)
- 7) Kyriakos Agavanakis, **George Karpetas**, Christos Michail, Evangelia Pappa and John Filos. [Practical machine learning based on cloud computing resources](#), Technologies and Materials for Renewable Energy, Environment and Sustainability TMREE19 Int'l Conf. Beirut-Lebanon/April 10-12, 2019.

Proceedings in Greek Scientific Conferences with Referees

- 1) **Γεώργιος Καρπέτας**, Χρήστος Μιχαήλ, Γεώργιος Φούντος, Ιωάννης Κανδαράκης, Γεώργιος Παναγιωτάκης, Προσομοίωση των απεικονιστικών χαρακτηριστικών του GE Discovery ST PET μέσω μεθόδων Monte Carlo, 11 Πανελλήνιο Συνέδριο Πυρηνικής Ιατρικής, 30 Μαρτίου-1 Απριλίου 2012, Αθήνα, Ελλάδα.