Giorgos Sfikas

Assistant Professor

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Summary

Dr. Giorgos SFIKAS received his B.Sc. and M.Sc. degrees in Computer Science from the Department of Computer Science, University of Ioannina, Greece in 2004 and 2007, respectively, and his Ph.D. degree in Image Processing and Computer Vision from the University of Strasbourg, France in 2012. He also holds a BA degree in History and Archaeology from the University of Ioannina. In 2014-2018, he worked as a Research Associate at the Institute of Informatics and Telecommunications of the National Center for Scientific Research "Demokritos" in Athens, Greece. During 2016-2020 he worked as a visiting lecturer at the University of Ioannina and in 2018-2020 as a Research Associate at the Information Technologies Institute of the Centre for Research and Technology - Hellas (CERTH) in Ioannina, Greece. Today he is an Assistant Professor at the department of Surveying and Geoinformatics Engineering of the University of West Attica. He has co-organized the PRA-ConBE workshop (satellite workshop of IAPR ICPR 2020), the 1st and 2nd Workshops on 3D Computer Vision and Photogrammetry (satellite workshops of IEEE ICIP 2023/2024), the 16th IAPR International Workshop on Document Analysis Systems (DAS 2024). His research interests include Machine Learning and Computer Vision. He has published more than 60 papers on journals and conferences on these fields (>1,300 citations, h-index=17), including on top venues such as CVPR, ECCV, ICLR and ICML.

Academic Formation

September 2012	**Ph.D. Computer science / Image Processing and Computer Vision** University of Strasbourg, France Thesis title: *"Non-linear statistical models for shape analysis : application to brain imaging" ("Modèles statistiques non linéaires pour l'analyse de formes : application à l'imagerie cérébrale")*. Supervisors: Christian Heinrich, Christophoros Nikou.
June 2007	**M.Sc. Computer Science** University of Ioannina, Greece Thesis title: *"Statistical methods for content-based image retrieval"*. Supervisor: Nikolaos P. Galatsanos.
December 2014	**B.A. History and Archaeology** University of Ioannina, Greece
October 2004	**B.Sc. Computer Science** University of Ioannina, Greece

Teaching Experience

Sep. 2022 – · · · · **Assistant Professor at the Department of Surveying and Geoinformatics Engineering, University of West Attica (Athens, Greece)** Courses taught: Computer Vision (Msc course on Artificial Intelligence and Visual Computing), Introduction to Photogrammetry, Photogrammetry III, Analytic Geometry, Computer Graphics.

Sep. 2020 – Aug. 2022 **Visiting Lecturer at the Department of Surveying and Geoinformatics Engineering, University of West Attica (Athens, Greece)** Courses taught: Analytic Geometry & Computer Graphics.

Sep. 2016 – Aug. 2020 **Visiting Lecturer at the Department of Computer Science & Engineering, University of Ioannina (Ioannina, Greece)** Courses taught: Digital Image Processing, Computer Vision, Linear Algebra.

Sep. 2011 – Jun. 2012 **Teaching & Laboratory Assistant (Poste "ATER") at the École Nationale Supérieure de Physique de Strasbourg (Strasbourg, France)** Courses assisted: Digital Image Processing, Introduction to C / C++.

Sep. 2004 – Jan. 2006 **Teaching & Laboratory Assistant at the Computer Science & Engineering department (University of Ioannina, Ioannina, Greece)** Courses assisted: Introduction to Probability, Introduction to Programming.

Work Experience (Non-Teaching)

Feb. 2021 – Sep. 2022 **Research Engineer** CIL/IIT laboratory, National Center for Scientific Research "Demokritos" (Athens, Greece).

Jan. 2020 – Sep. 2022 **Research Engineer** Image processing and analysis laboratory, Dept. of Comp. Science and Engineering, University of Ioannina (Ioannina, Greece)

Nov. 2018 – Jun. 2020 **Research Engineer** ITI laboratory, CERTH (Ioannina, Greece)

Apr. 2014 – Oct 2018 **Research Engineer** CIL/IIT laboratory, NCSR "Demokritos" (Athens, Greece)

Mar. 2013 – Dec 2013 **Specialty: Network Administrator – IT Professional** Greek armed forces

Oct. 2008 – Aug. 2012 **Research Engineer** LSIIT/MIV (iCube) Laboratory (Strasbourg, France)

Sep. 2005 – Sep. 2008 **Research Engineer / Laboratory assistant** IPAN Laboratory (Ioannina, Greece)

Jun. 2003 – Sep. 2003 **Software Engineer** Aid engineering co. (Athens, Greece)

Sep. 2000 – Aug. 2001 **Network Administrator** CS support team, University of Ioannina (Ioannina, Greece)

Participation in Research Projects

Jun. 2023 – Feb. 2024 **MOTION (Horizon 2020 / European Commission funded)** Image and LiDAR Fusion for Vehicle exterior inspection. Project MOTION aims to facilitate the process of exterior vehicle inspection using a solution including a robust Structure-from-Motion pipeline which combines LiDAR and RGB inputs and a framework for illumination invariant image matching in high dynamic environments.

Participation in Research Projects (continued)

Feb. 2021 – Feb. 2023
CULDILE (Research – Create – Innovate / NSRF funded) "Cultural Dimensions of Deep Learning": Research on Deep Learning & Vision techniques applied to large document imaging databases.

Jan. 2020 – Oct. 2023
BESSARION (Open Innovation in Culture / NSRF funded) Byzantine Electronic Scholar on-the-Spot: Automatic inscription analysis, transcription and translation. Research on multiple modern facets of AI including Computer Vision, Probabilistic Modeling, Deep Learning and Natural Language Processing. *Authored the project proposal and directed the project.*

May 2019 – Jun. 2020
BIMERR (Horizon 2020 / European Commission funded) Aiming at enhanced Building Information Modelling (BIM) and the Architecture, Engineering & Construction (AEC) field: Research on employing novel Computer Vision and Machine Learning techniques to develop a new toolkit to support renovation stakeholders.

Nov. 2018 – Jun. 2020
eDREAM (Horizon 2020 / European Commission funded) Enabling new demand response advanced, market oriented and secure technologies, solutions and business models: Research on computer vision techniques for multimodal (RGB/IR) processing, captured by Unmanned Automated Vehicles in order to estimate Demand Response potential.

Jun. 2017 – Nov. 2017
COR-skills (Erasmus+ KA2 program / European Commission funded) Collaborative learning for patient-focused interventions in gait rehabilitation after orthopedic surgery.

Jan. 2016 – Oct. 2018
READ (Horizon 2020 / European Commission funded) Recognition and Enrichment of Archival Documents. Research & Development on Computer Vision techniques for Automatic Handwriting Recognition and Keyword Spotting.

Sep. 2015 – Dec. 2015
SYNAISTHISI (EPAN II / NSRF funded) Smart networks for collection and processing of data for energy management.

Apr. 2014 – Apr. 2015
OldDocPro (ARISTEIA / NSRF funded) Novel techniques for automatic recognition of historical greek manuscripts. Research on computer vision methods for document image processing.

Jan. 2008 – Mar. 2008
Bayesian Methodologies (NSRF funded) Bayesian methodologies applied to medical image analysis («Μπεϋζιανές μεθοδολογίες – εφαρμογή στην ανάλυση ιατρικών εικόνων») Research on Bayesian methodologies for image segmentation.

Jan. 2007 – Jun. 2008
INTERSTORE (NSRF funded) («Αποκεντρωμένη κοινοχρησία δεδομένων με εφαρμογές στην επεξεργασία βιοϊατρικών εικόνων») Research on image registration and segmentation in the context of biomedical imaging.

Participation in Research Projects (continued)

Sep. 2006 – Dec. 2006   ▮ **MRI & RLS (NSRF funded)** Magnetic Resonance Imaging and the Restless Leg Syndrome («Μαγνητική τομογραφία στο σύνδρομο ανήσυχων ποδιών»). Research and imaging data analysis in the context of studying the Restless Leg Syndrome.

Student Supervision

Panagiotis Dimitrakopoulos   ▮ PhD Thesis, "Combining Bayesian and Deep Learning Methods in Computer Vision Problems" (to be defended in September 2024).

Iasonas Panagos   ▮ PhD Thesis, "Lip-reading using probabilistic inference and deep learning" (in progress, to be defended in 2025).

Panagiotis Dimitrakopoulos   ▮ Msc Thesis, "Variational Bayesian Blind Color Deconvolution of Histopathological Images"

Panagiotis Kouzouglidis   ▮ Diploma Thesis, "Automatic Video Colorization using 3D conditional Generative Adversarial Networks".

Panagiotis Dimitrakopoulos   ▮ Diploma Thesis, "Cell Classification and Nuclei Detection Using Deep Convolutional Neural Networks".

Giorgos Koukouzas   ▮ Diploma Thesis, "Image Segmentation in the context of Autonomous Driving using Mask R-Convolutional Neural Network (Mask R-CNN)".

Alexandros Giohalas   ▮ Diploma Thesis, "Keyword Spotting using Variational Autoencoders and PHOC networks".

Giorgos Tsigkas   ▮ Diploma Thesis, "Automatic detection of prehistoric rock paintings using computer vision methods".

Victor Megir   ▮ Diploma Thesis, "Using Gaussian Mixture Models with Deep Neural Network features for Image Segmentation".

Angelos Katsaliros   ▮ Diploma Thesis, "Road crack segmentation and detection with quaternion neural networks".

Leonidas Zafeiriou   ▮ Diploma Thesis, "Keyword Spotting using Quaternionic representations".

Christina Kourou   ▮ Diploma Thesis, "Image Retrieval for Byzantine Art using Deep Features and Mixture Models".

Ioannis Georvasilis   ▮ Diploma Thesis, "Inpainting text instances with Generative Adversarial Networks".

Eirinaios Kyritsis   ▮ Diploma Thesis, "A self-guided autonomous vehicle with a Convolutional Neural Network running on a Raspberry Pi".

Alexandros Kalpazidis   ▮ Diploma Thesis, "Deep Image Denoising".

Research

Research interests: Machine Learning, Computer Vision, Photogrammetry, Cultural Heritage Applications
69 peer-reviewed publications (10 journal + 57 conference + 2 book chapters)
h-index: 17 • ≥ 1380 citations (Google scholar info, as of September 2024)
Full publication list: https://www.cse.uoi.gr/~sfikas/publications.html

Selected publications

1. P. Dimitrakopoulos, **G. Sfikas**, and C. Nikou, "Implicit Neural Representation Inference for low-dimensional Bayesian Deep Learning," in *International Conference on Learning Representations (ICLR)*, 2024.

2. K. Nikolaidou, G. Retsinas, **G. Sfikas**, and M. Liwicki, "DiffusionPen: Towards controlling the style of handwritten text generation," in *European Conference on Computer Vision (ECCV)*, 2024.

3. P. Dimitrakopoulos, **G. Sfikas**, and C. Nikou, "Variational Feature Pyramid Networks," in *International Conference on Machine Learning (ICML)*, PMLR, 2022, pp. 5142–5152.

4. G. Retsinas, **G. Sfikas**, C. Nikou, and P. Maragos, "From Seq2Seq recognition to handwritten word embeddings.," in *British Machine Vision Conference (BMVC)*, 2021, p. 98.

5. **G. Sfikas**, D. Ioannidis, and D. Tzovaras, "Quaternion Harris for multispectral keypoint detection," in *IEEE International Conference on Image Processing (ICIP)*, IEEE, 2020, pp. 11–15.

6. G. Tsigkas, **G. Sfikas**, A. Pasialis, A. Vlachopoulos, and C. Nikou, "Markerless detection of ancient rock carvings in the wild: Rock art in Vathy, Astypalaia," *Pattern Recognition Letters*, vol. 135, pp. 337–345, 2020.

7. G. Retsinas, G. Louloudis, N. Stamatopoulos, **G. Sfikas**, and B. Gatos, "An alternative deep feature approach to line level keyword spotting," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019, pp. 12 658–12 666.

8. **G. Sfikas** and C. Nikou, "Bayesian multiview manifold learning applied to hippocampus shape and clinical score data," in *Bayesian and Graphical Models for Biomedical Imaging workshop, held in conjunction with MICCAI 2016*, Springer, 2017, pp. 160–171.

9. **G. Sfikas**, C. Nikou, N. Galatsanos, and C. Heinrich, "Majorization-minimization mixture model determination in image segmentation," in *IEEE/CVF Computer Vision and Pattern Recognition (CVPR)*, IEEE, 2011, pp. 2169–2176.

10. **G. Sfikas**, C. Nikou, and N. Galatsanos, "Edge preserving spatially varying mixtures for image segmentation," in *IEEE/CVF Computer Vision and Pattern Recognition (CVPR)*, IEEE, 2008, pp. 1–7.

11. **G. Sfikas**, C. Nikou, N. Galatsanos, and C. Heinrich, "MR brain tissue classification using an edge-preserving spatially variant Bayesian mixture model," in *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, Springer, 2008, pp. 43–50.

Awards and Achievements

2019   Received best student paper award in IEEE BIBE 2019.

2016   Received best paper award in MICCAI 2016 workshop "Bayesian and Graphical Models in Biomedical Imaging".

2008   Paper selected for oral presentation in IEEE/CVF CVPR 2008 (top 3% of papers).

Translations

December 2021   Editor of the translation of H. Anton-C. Rorres, "Elementary Linear Algebra" into Greek. Translation process organized by Gutenberg Editions.

Conference Organization

2024   Program Chair of the 16th IAPR Workshop on Document Analysis Systems (DAS 2024).

Publication Chair of the 18th IAPR International Conference on Document Analysis Systems (ICDAR 2024).

Chair of the 2nd Workshop on 3D Computer Vision and Photogrammetry (3DCVP 2023). In conjunction with ICIP 2024.

2023   Chair of the 1st Workshop on 3D Computer Vision and Photogrammetry (3DCVP 2023). In conjunction with ICIP 2023.

2021   Chair of the Workshop on Pattern Recognition and Automation in Construction & the Built Environment (PRAConBE). Held in conjunction with ICPR 2020.

Professional Memberships

Member of the Institute of Electrical and Electronics Engineers (IEEE).

Member of the Hellenic Artificial Intelligence Society (EETN).

Member of the Computer Vision Foundation (CVF).

Member of the British Machine Vision Association (BMVA).

Miscellaneous Experience

Reviewer duty

Has served as reviewer for: AAAI Conference on Artificial Intelligence (AAAI), European Conference on Computer Vision (ECCV), British Machine Vision Conference (BMVC), IS-PRS Journal of Photogrammetry and Remote Sensing, IAPR International Workshop on Document Analysis Systems (DAS), IEEE Transactions on Image Processing, Computer Vision and Image Understanding, Pattern Recognition, Pattern Recognition Letters, EURASIP Journal on Advances in Signal Processing, Artificial Intelligence Review, Computer Vision and Pattern Recognition (CVPR), Medical Image Computing and Computer Assisted Intervention (MICCAI), International Conference in Pattern Recognition (ICIP), International Conference in Pattern Recognition (ICPR), Hellenic Conference on Artificial Intelligence (SETN), European Signal Processing Conference (EUSIPCO), International Conference on Frontiers in Handwriting Recognition (ICFHR), International Conference on Document Analysis and Recognition (ICDAR), IEEE Image, Video, and Multidimensional Signal Processing Workshop (IVMSP), Digital Signal Processing, MDPI Journal of Imaging, PloS One.

Miscellaneous Experience (continued)

Participation in Seminars & Summer Schools

July 2011 ◾ 3rd summer seminar at the Archaeological Site of Akrotiri ("the Griphos project"), Santorini, Greece, 2011. Workshop faculty included T.Funkhouser, P.Bogucki, W.Childs, D.Gondicas, J.Smith (Princeton University), L.Van Gool and P.Dutré (KU Leuven), T.Weyrich (UCL), C.Doumas (U.Athens), A.Vlachopoulos (U.Ioannina), A.Papalexandrou (U.Texas at Austin).

July 2009 ◾ International Computer Vision summer school (ICVSS): "Machine learning for Computer Vision". Baia Samuele, Italy, 2009. Included talks held by T.Kanade, M.Black, N.Cristianini, A.Fitzgibbon, D.Forsyth, D.Huttenlocher, P.Kohli, Z.Ghahramani.

Other Skills

Languages ◾ Greek (native), English (fluent), French (excellent).

Coding ◾ Python, C/C++, Matlab, Java, Ruby, Rust, Tensorflow, Pytorch, Qt, Visual Studio.

Web Developing ◾ Django, HTML5/CSS3, Javascript, Joomla.

Operating Systems ◾ Ubuntu/Debian/SuSE Linux, Raspbian, Windows, Windows server, Solaris, IRIX, FreeBSD, OpenBSD.