Ioannis Kakogeorgiou

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Research & Other Work Experience

Researcher (Grade C)   Jul 2025 - now
Institute of Informatics and Telecommunications | NCSR "Demokritos"

- Research on state-of-the-art deep learning for computer vision and applications in satellite remote sensing.

Postdoctoral Researcher   Sep 2024 - May 2025
Archimedes Unit | Athena Research Center

- Explored the integration of representation learning and generative modeling in computer vision.

Doctoral Researcher   May 2021 - Aug 2024
National Technical University of Athens

- Contributed in diverse roles—including design, supervision, and development—to several EU-funded and national excellence/competitive research projects.
- Provided teaching assistance and co-supervised seven (7) Master's theses.

Research Assistant   Aug 2020 - May 2021
National Technical University of Athens

- Designed and developed solutions for research projects.

Data Scientist   Mar 2018 - May 2019
Feel Therapeutics

- Implemented mathematical models, including Markov models, and developed real-time evaluation methods for time series data.
- Designed and developed pipelines for data preprocessing, performance evaluation, and automated reporting, and maintained web applications.

Private Math Tutor   Feb 2011 - Jun 2016
Self-employed

Education

2021 - 2024   **PhD** at National Technical University of Athens
Supervisors: Prof. Konstantinos Karantzalos & Assistant Prof. Nikos Komodakis.
In collaboration with: University of Crete, valeo.ai, Institute of Advanced Research in Artificial Intelligence (IARAI), KAUST, Athena RC.
Thesis Title: Unsupervised Learning and Explainable Artificial Intelligence in Computer Vision and Remote Sensing.

2016 - 2018   **M.Sc** in **Mathematical Modelling in Modern Technologies and Finance** at National Technical University of Athens   (GPA: 9.1/10)
Focus: Neural Networks, Machine Learning, Computer Vision & Remote Sensing.
Master Thesis: Visual Question Answering with Deep Learning.

2010 - 2016   **B.Sc Mathematics** at University of Athens (GPA: 7.1/10 | Top 14% of graduating class)
Specialization in Applied Mathematics
Certification in Mathematics Education

Research Projects

Edge SpAIce: Unleashing AI Potential to Foster Space Accessibility and Novel Earth Observation Services Creation (HORIZON EU)   2024 - 2026
National Technical University of Athens

eOSD: An Intelligent Early-Warning Oil Spill Detection and Prediction System for the Arabian Gulf and the Red Sea (KAUST)   2022 - 2024
National Technical University of Athens

iToBoS: Intelligent Total Body Scanner for Early Detection of Melanoma (H2020)   2021 - 2025
National Technical University of Athens

RAMONES: Radioactivity Monitoring in Ocean Ecosystems (H2020)   2021 - 2024
National Technical University of Athens

SOSAME - A Prototype Method of Diagnosis, Documentation and Demonstration – Analysis of Rescue Excavations (EPAnEK)   2020 - 2022
Ionian University / National Technical University of Athens

Teaching (Adjunct Lecturer)

Image Analysis & Computer Vision (Undergraduate)   Spring 2024-25
Department of Informatics and Telecommunications, National and Kapodistrian University of Athens

Image Processing (Undergraduate)   Spring 2024-25
Department of Informatics and Telecommunications, National and Kapodistrian University of Athens

Machine learning (Postgraduate)   Fall 2024-25
Department of Informatics and Telematics, Harokopio University of Athens

Publications

[1] B. Psomas, D. Christopoulos, E. Baltzi, **I. Kakogeorgiou**, T. Aravanis, N. Komodakis, K. Karantzalos, Y. Avrithis, G. Tolias, "Attention, Please! Revisiting Attentive Probing for Masked Image Modeling", *Under review*, 2025. DOI: arXiv:2506.10178.

[2] T. Kouzelis, E. Karypidis, **I. Kakogeorgiou**, S. Gidaris, N. Komodakis, "Boosting Generative Image Modeling via Joint Image-Feature Synthesis", *Under review*, 2025. DOI: arXiv:2504.16064.

[3] T. Kouzelis, **I. Kakogeorgiou**, S. Gidaris, N. Komodakis, "EQ-VAE: Equivariance Regularized Latent Space for Improved Generative Image Modeling", *International Conference on Machine Learning (ICML)*, 2025. DOI: https://openreview.net/forum?id=UWhW5YYLo6.

[4] E. Karypidis, **I. Kakogeorgiou**, S. Gidaris, N. Komodakis, "Advancing Semantic Future Prediction through Multimodal Visual Sequence Transformers", *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025. DOI: openaccess.thecvf.com.

[5] E. Karypidis, **I. Kakogeorgiou**, S. Gidaris, N. Komodakis, "DINO-Foresight: Looking into the Future with DINO", *Under review*, 2024. DOI: arXiv:2412.11673.

[6] **I. Kakogeorgiou**, S. Gidaris, K. Karantzalos, N. Komodakis, "SPOT: Self-Training with Patch-Order Permutation for Object-Centric Learning with Autoregressive Transformers", *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024. DOI: 10.1109/CVPR52733.2024.02149.

[7] K. Kikaki, **I. Kakogeorgiou**, I. Hoteit, K. Karantzalos, "Detecting Marine pollutants and Sea Surface features with Deep learning in Sentinel-2 imagery", *ISPRS Journal of Photogrammetry and Remote Sensing*, 2024. DOI: `10.1016/j.isprsjprs.2024.02.017`.

[8] **I. Kakogeorgiou**, P. Mikeli, K. Kikaki, E. Prassou, K. Karantzalos, "A Comparative Study on Sentinel-2 Cloud Detection Algorithms in Marine Environments", *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2024. DOI: `10.1109/IGARSS53475.2024.10642942`.

[9] B. Psomas, **I. Kakogeorgiou**, N. Efthymiadis, G. Tolias, O. Chum, Y. Avrithis, K. Karantzalos, "Composed Image Retrieval for Remote Sensing", *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2024. DOI: `10.1109/IGARSS53475.2024.10642874`.

[10] B. Psomas, **I. Kakogeorgiou**, K. Karantzalos, Y. Avrithis, "Keep It SimPool: Who Said Supervised Transformers Suffer from Attention Deficit?", *International Conference on Computer Vision (ICCV)*, 2023. DOI: `10.1109/ICCV51070.2023.00493`.

[11] **I. Kakogeorgiou**, S. Gidaris, B. Psomas, Y. Avrithis, A. Bursuc, K. Karantzalos, N. Komodakis, "What to Hide from Your Students: Attention-Guided Masked Image Modeling", *European Conference on Computer Vision (ECCV)*, 2022. DOI: `10.1007/978-3-031-20056-4_18`.

[12] K. Kikaki, **I. Kakogeorgiou**, P. Mikeli, D. E. Raitsos, K. Karantzalos, "MARIDA: A benchmark for Marine Debris detection from Sentinel-2 remote sensing data", *PLOS ONE*, 2022. DOI: `10.1371/journal.pone.0262247`.

[13] P. Mikeli, K. Kikaki, **I. Kakogeorgiou**, K. Karantzalos, "How Challenging is the Discrimination of Floating Materials on the Sea Surface using High Resolution Multispectral Satellite Data?", *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 2022. DOI: `10.5194/isprs-archives-XLIII-B3-2022-151-2022`.

[14] **I. Kakogeorgiou**, K. Karantzalos, "Evaluating explainable artificial intelligence methods for multi-label deep learning classification tasks in remote sensing", *International Journal of Applied Earth Observation and Geoinformation*, 2021. DOI: `10.1016/j.jag.2021.102520`.

MSc Students (co-supervised)

E. Prassou *Cloud Detection from Sentinel-2 Imagery in Marine Environments (in progress)*

J. Manesis *Oil Spill Detection on the Sea Surface using Synthetic Aperture Radar Data (in progress)*

K. Konstantinidis *Object-centric generative modeling: merging unsupervised segmentation learning with image synthesis*

I. Tsiotas *Utilizing self-supervised methods in unsupervised metric learning*

A. Chatsikian *Detection of Marine Pollutants Through Satellite Images Using Deep Learning Techniques*

N. Maniatis *Denoising Distributed Acoustic Sensing data with Self-Supervised Deep Learning*

P. Mavrepis *Exploiting feature- & logit-based knowledge distillation for improved teacher-student deep neural networks*

Scientific Activities & Awards

2025   Our **two ICML & CVPR 2025 papers** "EQ-VAE: Equivariance Regularized Latent Space for Improved Generative Image Modeling" & "Advancing Semantic Future Prediction through Multimodal Visual Sequence Transformers" are selected for **Oral** presentations at **Greeks in AI Symposium 2025**, Athens.

2024   Our **CVPR 2024 paper** "SPOT: Self-Training with Patch-Order Permutation for Object-Centric Learning with Autoregressive Transformers" is selected as a **Highlight**, Seattle.

2024	Our **two IGARSS 2024 papers** "A Comparative Study on Sentinel-2 Cloud Detection Algorithms in Marine Environments" & "Composed Image Retrieval for Remote Sensing" are selected for **Oral** presentations.
2024	**Summer School Instructor** at IEEE IGARSS SUMMER SCHOOL, Athens.
2022	**Invited talk** to present our ECCV paper "What to Hide from Your Students: Attention-Guided Masked Image Modeling" at **Instance-Level Recognition** ECCV workshop.
2022	**Invited at poster session** to present again our ECCV paper "What to Hide from Your Students: Attention-Guided Masked Image Modeling" at **Self Supervised Learning: What is Next?** ECCV workshop.
2022	**Granted two RTX A5000 24GB** thought NVIDIA Academic Hardware Grant Program to support my research on Marine Litter Detection with Remote Sensing Satellite Data.
2022	**Awarded a PhD scholarship** from the Hellenic Foundation for Research & Innovation (grant: 11252).
2022	**Granted computational time** in the Greek HPC facility ARIS (GRNET) under project PR012047.
2022	**ISPRS Best Poster Award** to our ISPRS Congress paper "How challenging is the discrimination of floating materials on the sea surface using high resolution multispectral satellite data?", Nice.
2021 - now	**Reviewer** at CVPR, ICCV, ECCV, WACV, IEEE TNNLS (14 IF), IJCV (13 IF), Neural Networks (9 IF), IEEE GRSL (5 IF), IEEE Access (3 IF).
2021	**Presenting** our research on "Detecting and Classifying Marine Plastic Debris from high-resolution multispectral satellite data" - A. Kikaki, **I. Kakogeorgiou**, P. Mikeli, D. E. Raitsos, and K. Karantzalos, DOI: 10.5194/egusphere-egu21-15243 at the geoscientists meeting **EGU General Assembly**.
2020	**Completed** the online Specialization **Generative Adversarial Networks (GANs)** from DeepLearning.AI.
2020	**Completed** the online course **Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning** from DeepLearning.AI.
2020	**Completed** the online course **CS-191x: Quantum Mechanics and Quantum Computation** from University of California, Berkeley.
2020	**Participant in Qiskit Global Summer School** obtaining the **Certificate of Quantum Excellence** from IBM.
2018	**Selected among 260** candidates (42 finalists), **top 15%**, for attending **a specialization program** of 120 hours on **Data Science & Data Engineering**. The program was conducted by ReGeneration, a project of the Global Shapers Athens Hub, an initiative of the World Economic Forum.