Ioannis Kakogeorgiou

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Research & Other Work Experience

Postdoctoral Researcher Sep 2024 - now
Archimedes Unit | Athena Research Center

- Explore the integration of representation learning and generative modeling in computer vision, along with advancements in NLP to enhance visual understanding and generation.

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

- Projects:
  1. eOSD: An Intelligent Early-Warning Oil Spill Detection and Prediction System for the Arabian Gulf and the Red Sea, KAUST
  2. iToBoS: Intelligent Total Body Scanner for Early Detection of Melanoma, H2020
  3. RAMONES: Radioactivity Monitoring in Ocean Ecosystems, FET-H2020
  4. Edge SpAIce: Unleashing AI Potential to Foster Space Accessibility and Novel Earth Observation Services Creation, HORIZON EUROPE-E.C.
- Co-supervised six (6) Master Thesis
- Teaching assistant - Remote Sensing Special Course, School of Rural, Surveying and Geoinformatics Engineering

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

- Project: SOSAME - A Prototype Method of Diagnosis, Documentation and Demonstration – Analysis of Rescue Excavations, Ionian University

Data Scientist Mar 2018 - May 2019
Feel Therapeutics

- Development of mathematical models, including Markov models, and creation of real-time evaluation methods for time series data.
- Design and maintenance of applications for data preprocessing, evaluation, automatic reporting, and web application updates.

Private Math Tutor Feb 2011 - Jun 2016
Self-employed

Education

2021 - 2024 **PhD** at National Technical University of Athens
Supervisors: Konstantinos Karantzalos, Nikos Komodakis.
In collaboration with: valeo.ai, University of Crete, 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

Publications

[1] **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: arXiv:2312.00648.

[2] 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.

[3] **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.

[4] 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: arXiv:2405.15587.

[5] 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.

[6] **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.

[7] 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.

[8] 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.

[9] **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.

Scientific Activities & Awards

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, 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.