# NIKOLAOS IOANNIS BOUNTOS

*GitHub*
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## RESEARCH INTERESTS

Deep Learning, Computer Vision, Earth Observation

## EDUCATION

**PhD candidate in Computer Science** Sept 2025 (Expected)
Orion Lab, National Technical University of Athens & National Observatory of Athens
Degree awarded by Harokopio University of Athens
Thesis: *Multimodal Representation Learning for Earth Observation*

**MSc in Data Engineering and Analytics** Feb 2020
Technical University of Munich
Thesis: *Subpixel Classification of Anthropogenic Features Using Deep Learning on Sentinel-2 Data*

**BSc in Computer Science** Sept 2016
Aristotle University of Thessaloniki
Thesis: *Study of Causal Inference Algorithms*

## RESEARCH & WORK EXPERIENCE

**AI Researcher / PhD Candidate** *Jan 2021 – Present*
Orion Lab, National Technical University of Athens & National Observatory of Athens
Supervisor: *Ioannis Papoutsis*
Led research on multimodal representation learning for Earth Observation, resulting in multiple publications in top ML conferences (ICCV, NeurIPS, AAAI) and Earth Observation journals (TGRS, ISPRS and others).
Contributed to EU projects including DeepCube and ThinkingEarth.
Supervised master's and PhD students.

**Research Intern** *Apr 2023 – Nov 2023*
Mila – Quebec AI Institute
Supervisor: *David Rolnick*
Investigated methods for the creation and evalution of sensor-agnostic, flexible foundation models for Earth Observation.

**Visiting Researcher & Beyond Fellow** *Sept 2022 – Dec 2022*
AI4EO Future Lab, Technical University of Munich
Supervisor: *Xiaoxiang Zhu*
Studied modality domination in multimodal representation learning in Earth Observation.

**Artificial Intelligence Engineer** *Dec 2019 – Apr 2020*
Motius
Developed deep learning methods for turbine fault detection using 3D point cloud data.

**Master's Thesis on Computer Vision for Earth Observation** *Apr 2019 – Sept 2019*
Esri Deutschland

Supervisor: *Thomas Huckle*

Explored deep learning methods for subpixel land cover classification using UAV and Sentinel-2 data.

**Working Student, Data Analytics** *July 2018 – Feb 2019*
KPIT

Performed log analysis and extracted actionable user behavior insights.

**Working Student, Data Scientist** *Oct 2017 – Jan 2018*
Trillr.com

Designed and maintained a structured database for product and user traffic data.
Analyzed user behavior to generate actionable business insights communicated to stakeholders.
Automated business insights generation for improved decision making.

**Web Developer** *Dec 2016 – Apr 2017*
Newte

Designed and developed custom websites tailored to client requirements.
Enhanced and extended features of existing websites.

## AWARDS/SCHOLARSHIPS

- **Best Paper Award** at the **ICCV 2023 AI + HADR** workshop for our paper **TeleViT: Teleconnection-driven Transformers Improve Subseasonal to Seasonal Wildfire Forecasting**.
- **International Research Center on Artificial Intelligence under the auspices of UNESCO Global Top 100 list 2022-23** for the project: **Pluto - A global volcanic unrest early warning system**, rated as **Excellent**.
- **Beyond Fellow Scholarship** of the AI4EO Future Lab of the Technical University of Munich
- **European Union Agency for the Space Program - Cassini Challenge**: winner of the idea track

## SELECTED TALKS

- Foundation Models for Earth Observation, Living Planet 2025, Vienna, Austria
- A Practical Session on Deep Learning Advances for Monitoring and forecasting Natural Hazards, IGARSS 2024, Athens, Greece
- Deep Learning for monitoring and forecasting natural hazards with earth observation data, IGARSS 2023, Pasadena, California

## OTHER ACTIVITIES

- Reviewer for NeurIPS 2025, AAAI 2026, IEEE Transaction on Geoscience and Remote Sensing, ICANN-23
- Scientific Committee for the ESA-NASA International Workshop on AI Foundation Model for EO.

## PUBLICATIONS

- Kondylatos Spyros*, **Nikolaos Ioannis Bountos***, Michail Dimitrios, Zhu Xiao Xiang, Camps-Valls Gustau, Papoutsis Ioannis. "On the Generalization of Representation Uncertainty in Earth Observation." Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 2025.

- **Nikolaos Ioannis Bountos***, Maria Sdraka*, Angelos Zavras, Ilektra Karasante, Andreas Karavias, Themistocles Herekakis, Angeliki Thanasou, Dimitrios Michail, Ioannis Papoutsis. "Kuro Siwo: 33 billion $m^2$ under the water. A global multi-temporal satellite dataset for rapid flood mapping." Advances in Neural Information Processing Systems 37 (2025): 38105-38121.
- **Nikolaos Ioannis Bountos**, Arthur Ouaknine, Ioannis Papoutsis, and David Rolnick. "Fomo: Multi-modal, multi-scale and multi-task remote sensing foundation models for forest monitoring." Proceedings of the AAAI Conference on Artificial Intelligence. Vol. 39. No. 27. 2025.
- Wang, Yi, Zhitong Xiong, Chenying Liu, Adam J. Stewart, Thomas Dujardin, **Nikolaos Ioannis Bountos**, Angelos Zavras, Franziska Gerken, Ioannis Papoutsis, Laura Leal-Taix'e and Xiao Xiang Zhu. "Towards a Unified Copernicus Foundation Model for Earth Vision." Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 2025
- Spyros Kondylatos, **Nikolaos Ioannis Bountos**, Ioannis Prapas, Angelos Zavras, Gustau Camps-Valls, Ioannis Papoutsis. "Probabilistic Machine Learning for Noisy Labels in Earth Observation." Scientific Reports (2025).
- Papadopoulos, Nikolas, **Nikolaos Ioannis Bountos**, Maria Sdraka, Andreas Karavias and Ioannis Papoutsis. "Hephaestus Minicubes: A Global, Multi-Modal Dataset for Volcanic Unrest Monitoring." (2025).
- Michail, D., Davalas, C., Panagiotou, L. I., Prapas, I., Kondylatos, S., **Bountos, N. I.**, & Papoutsis, I. (2025). FireCastNet: Earth-as-a-Graph for Seasonal Fire Prediction. arXiv preprint arXiv:2502.01550.
- Michail, D., Panagiotou, L. I., Davalas, C., Prapas, I., Kondylatos, S., **Bountos, N. I.**, & Papoutsis, I. (2024). Seasonal fire prediction using spatio-temporal deep neural networks. arXiv preprint arXiv:2404.06437.
- Papoutsis, Ioannis, **Bountos Nikolaos Ioannis**, Zavras Angelos, Michail Dimitrios, Tryfonopoulos Christos. "Benchmarking and scaling of deep learning models for land cover image classification." ISPRS Journal of Photogrammetry and Remote Sensing 195 (2023): 250-268.
- Prapas, Ioannis, **Nikolaos Ioannis Bountos**, Spyros Kondylatos, Dimitrios Michail, Gustau Camps-Valls and Ioannis Papoutsis. Prapas, Ioannis, et al. "Televit: Teleconnection-driven transformers improve subseasonal to seasonal wildfire forecasting." Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops. 2023.
- **Nikolaos Ioannis Bountos**, Dimitrios Michail, and Ioannis Papoutsis. "Learning from Synthetic InSAR with Vision Transformers: The case of volcanic unrest detection." IEEE Transactions on Geoscience and Remote Sensing (2022).
- **Bountos, Nikolaos Ioannis**, Papoutsis, I., Michail, D., Karavias, A., Elias, P., & Parcharidis, I. (2022). "Hephaestus: A large scale multitask dataset towards InSAR understanding." Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops. 2022.
- **Nikolaos Ioannis Bountos**, Ioannis Papoutsis, Dimitrios Michail, Nantheera Anantrasirichai. "Self-supervised contrastive learning for volcanic unrest detection." IEEE Geoscience and Remote Sensing Letters 19 (2021): 1-5.

*First two authors contributed equally.