SPYROS KONDYLATOS

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RESEARCH INTERESTS

Uncertainty • Computer Vision • Representation Learning • Earth Observation • AI for Environmental Sciences

EDUCATION

PH.D. RESEARCHER Valencia, Spain
University of Valencia Nov 2021 - Oct 2025 (Expected)
Thesis: "Uncertainty-Aware Deep Learning for Earth Observation". **Supervisor**: Prof. Gustau Camps-Valls.

MSC IN DATA SCIENCE Athens, Greece
Athens University of Economics and Business Sep 2016 - Sep 2017
Thesis: "Face Recognition using Convolutional Neural Networks". **Supervisor**: Assistant Prof. Michalis Titsias.

MSC IN APPLIED MATHEMATICS Athens, Greece
National and Kapodistrian University of Athens Sep 2014 - Sep 2016
Thesis: "The Large Deviation Principle in the Erdős–Rényi random graph". **Supervisor**: Prof. Dimitris Cheliotis.

BSC IN MATHEMATICS Athens, Greece
National and Kapodistrian University of Athens Sep 2009 - Sep 2013
Top 1 % in class (GPA: 9.29/10)

RESEARCH & WORK EXPERIENCE

ORION LAB, NATIONAL OBSERVATORY OF ATHENS, NATIONAL TECHNICAL UNIVERSITY OF ATHENS Greece
Researcher Dec 2020 - Aug 2025

- Research in uncertainty-aware deep learning for Earth observation and wildfire danger forecasting.
- Presented work in major Machine Learning and Remote Sensing conferences, such as ICCV, NeurIPS, IGARSS, LPS.
- Curated and published large-scale datasets (FireCube, Mesogeos, SeasFire Cube).
- Participated in EU- and ESA-funded projects (DeepCube, TREEADS, SeasFire).
- Co-developed a wildfire danger forecasting system in collaboration with the Hellenic Fire Service.
- Supervised Master's students.

MANTEO AI Athens, Greece
Co-Founder Dec 2023 – Present

- A chat-map assistant that integrates LLMs with geospatial analysis tools to make Earth observation insights more accessible. Link: Manteo AI

OMILIA CONVERSATIONAL INTELLIGENCE Athens, Greece
Lead Data Scientist Mar 2020 - Nov 2020

- Led and mentored a team of three data scientists and analysts.
- Developed and served as product owner for a semi-automatic sentence labeling tool using NLP techniques, reducing manual annotation efforts by approximately 50%.
- Projects: *Text data augmentation* combining DL with rule-based methods, *Text clustering and classification* with LSTMs and Transformers, *Text Representation learning* with variational autoencoders.

OMILIA CONVERSATIONAL INTELLIGENCE Athens, Greece
Data Scientist Jul 2018 - Mar 2020

- Data analyses and visualization dashboards, translating technical findings into insights for non-technical stakeholders.

WORKABLE Athens, Greece
Master Thesis Student Jun 2017 - Sep 2017

- Developed a face recognition system using Convolutional Neural Networks to match candidate face images within CVs.

PUBLICATIONS

JOURNALS & CONFERENCES

- **Kondylatos Spyros**, N. I. Bountos, D. Michail, X. X. Zhu, G. Camps-Valls, and I. Papoutsis. "On the Generalization of Representation Uncertainty in Earth Observation." *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.
- Camps-Valls Gustau, M.-Á. Fernández-Torres, K.-H. Cohrs, A. Höhl, A. Castelletti, A. Pacal, C. Robin, F. Martinuzzi, I. Papoutsis, I. Prapas, J. Pérez-Aracil, K. Weigel, M. Gonzalez-Calabuig, M. Reichstein, M. Rabel, M. Giuliani, M. D. Mahecha, O.-I. Popescu, O. J. Pellicer-Valero, S. Ouala, S. Salcedo-Sanz, S. Sippel, **S. Kondylatos**, T. Happé, and T. Williams. "Artificial intelligence for modeling and understanding extreme weather and climate events." *Nature Communications 16, 1919*, 2025. 10.1038/s41467-025-56573-8.
- Mantas Anastasios, F. Yfantis, D. Bilidas, G. Stamoulis, **S. Kondylatos**, I. Prapas, I. Papoutsis, H. María Tárraga, E. Sevillano Marco, F. Castel, C. Laine, and M. Koubarakis. "Plato: A Semantic Data Cube System Using Ontology-Based Data Access Technologies." *IEEE Access 12*, 2024. 130356–130374.
- **Kondylatos Spyros**, I. Prapas, G. Camps-Valls, and I. Papoutsis. "Mesogeos: A Multi-Purpose Dataset for Data-Driven Wildfire Modeling in the Mediterranean." *Advances in Neural Information Processing Systems 36* (December 15, 2023): 50661-76.
- **Kondylatos Spyros**, I. Prapas, M. Ronco, I. Papoutsis, G. Camps-Valls, M. Piles, M.-Á. Fernández-Torres, and N. Carvalhais. "Wildfire Danger Prediction and Understanding With Deep Learning." 2022. *Geophysical Research Letters, 49(17)*, e2022GL099368.

PREPRINTS

- **Kondylatos Spyros**, N. I. Bountos, I. Prapas, A. Zavras, G. Camps-Valls, and I. Papoutsis. "Probabilistic Machine Learning for Noisy Labels in Earth Observation." 2025. arXiv preprint arXiv.2504.03478.
- Anastasiou Nikolaos, **S. Kondylatos**, and I. Papoutsis. "Wildfire Spread Forecasting with Deep Learning." 2025. arXiv preprint arXiv.2505.17556.
- Michail Dimitrios, C. Davalas, L.-I. Panagiotou, I. Prapas, **S. Kondylatos,**, N.I. Bountos, I. Papoutsis, 2025. FireCastNet: Earth-as-a-Graph for Seasonal Fire Prediction. arxiv preprint arXiv.2502.01550.
- Michail Dimitrios, L.-I. Panagiotou, C. Davalas, I. Prapas, **S. Kondylatos**, N.I. Bountos, I. Papoutsis, 2024. "Seasonal Fire Prediction using Spatio-Temporal Deep Neural Networks." arxiv preprint arXiv.2404.06437/

WORKSHOPS & ABSTRACTS

- Bountos Nikolaos Ioannis, **S.Kondylatos**, D. Michail, X. X. Zhu, G. Camps- Valls, I. Papoutsis. "On the Generalization Capacity of Pretrained Uncertainties in Remote Sensing." *ESA-NASA International Workshop on AI Foundation Models for EO*, 2025.
- **Kondylatos Spyros**, I. Prapas, E. Vrachoriti, G. Camps-Valls, and I. Papoutsis "Short-term wildfire danger forecasting in the Mediterranean with Deep Learning using the Mesogeos Dataset". *Living Planet Symposium*, 2025.
- Prapas Ioannis, N. I. Bountos, **S. Kondylatos**, D. Michail, G. Camps-Valls and I. Papoutsis. "Televit: Teleconnection-driven transformers improve subseasonal to seasonal wildfire forecasting." *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*, 2023.
- **Kondylatos Spyros**, I. Prapas, G. Camps-Valls, and I. Papoutsis "Wildfire Danger Forecasting with Deep Learning Under Label Noise". *IGARSS*, 2023.
- Prapas Ioannis, I. Karasante, A. Ahuja, **S. Kondylatos,** E. Panagiotou, C. Davalas, L. Alonso, R. Son, M. Dimitrios, N. Carvalhais, I. Papoutsis, 2023. "Earth System Deep Learning towards a Global Digital Twin of Wildfires." *EGU General Assembly Conference Abstracts EGU*, 2023.
- Bilidas Dimitrios , A. Mantas, F. Yfantis, G. Stamoulis, M. Koubarakis, **S. Kondylatos,** I. Prapas, I. Papoutsis, 2023. "Fire Risk Management using Data Cubes, Machine Learning and OBDA systems", *Proceedings of the 31st ACM International Conference on Advances in Geographic Information Systems, SIGSPATIAL '23. Association for Computing Machinery, New York, NY, USA, pp. 1–4*.
- Ronco Michele, I. Prapas, **S. Kondylatos**, I. Papoutsis, G. Camps-Valls, M.-Á. Fernández-Torres, M. Piles Guillem, N. Carvalhais, 2022. "Explainable deep learning for wildfire danger estimation," *EGU*. 2022.
- Prapas Ioannis, A. Ahuja, **S. Kondylatos**, I. Karasante, E. Panagiotou, L. Alonso, C. Davalas, D. Michail, N. Carvalhais, and I. Papoutsis, "Deep Learning for Global Wildfire Forecasting." *Tackling Climate Change with Machine Learning Workshop, NeurIPS*, 2022.
- **Kondylatos Spyros**, I. Prapas, G. Camps-Valls, and I. Papoutsis "Deep Learning Methods for Daily Wildfire Danger Forecasting". *Living Planet Symposium*, 2022.
- Prapas Ioannis, A. Ahuja, **S. Kondylatos**, I. Karasante, E. Panagiotou, L. Alonso, C. Davalas, D. Michail, N. Carvalhais, and I. Papoutsis, "Earth System Deep Learning for Global Wildfire Forecasting" *ECMWF–ESA Workshop in Reading, UK*, 2022.

- Prapas Ioannis, **S. Kondylatos**, M. Ronco, I. Papoutsis, G. Camps-Valls, M. Piles, M.-Á Fernández-Torres, and N. Carvalhais (2021). "Deep Learning Methods for Daily Wildfire Danger Forecasting." *Artificial Intelligence for Humanitarian Assistance and Disaster Response Workshop, NeurIPS*, 2021.

AWARDS & SCHOLARSHIPS

- **NeurIPS 2023 Orals (Top 1%)**, - *"Mesogeos: A Multi-Purpose Dataset for Data-Driven Wildfire Modeling in the Mediterranean."* Datasets & Benchmarks Track.
- **Best Paper Award, ICCV 2023 AI + HADR Workshop** – *"TeleViT: Teleconnection-driven Transformers Improve Subseasonal to Seasonal Wildfire Forecasting."*
- **Winner of EU Cassini Challenges (Idea Track)** – Award for *Manteo AI*, a chat–map assistant integrating LLMs with Earth Observation data.
- **Selected for ESA BIC Greece** – €50,000 non-equity funding and incubation support for *Manteo AI*.
- **2nd Place, National Innovation Competition on Climate-related Disaster Management** – Award for *"Plato"*, an AI-based wildfire risk management system.
- Awarded merit-based scholarship for graduating **1st in class** (GPA: 9.66/10), MSc in Applied Mathematics.
- Awarded merit-based scholarship for graduating **1st in class** (GPA: 9.1/10), MSc in Data Science.

TALKS

- **Oral Presentation, ESA Living Planet Symposium 2025**, Vienna, Austria – *"Short-term Wildfire Danger Forecasting in the Mediterranean with Deep Learning Using the Mesogeos Dataset."*
- **Tutorial, IGARSS 2024**, Athens, Greece – *"A Practical Session on Deep Learning Advances for Monitoring and Forecasting Natural Hazards."*
- **Oral Presentation, NeurIPS 2023**, New Orleans, USA – *"Mesogeos: A Multi-Purpose Dataset for Data-Driven Wildfire Modeling in the Mediterranean."*
- **Tutorial, IGARSS 2023**, Pasadena, USA – *"Deep Learning for Monitoring and Forecasting Natural Hazards with Earth Observation Data."*
- **Oral Presentation, IGARSS 2023**, Pasadena, USA – *"Wildfire Danger Forecasting with Deep Learning Under Label Noise."*

WORKSHOPS & SUMMER SCHOOLS

- **Nordic Probabilistic AI School**, 2024, Copenhagen, Denmark.
- **3rd ELISE/ELLIS Research Program on Machine Learning for Earth and Climate Sciences**, 2023, Valencia, Spain – Theme: *"Extreme Event Detection, Analysis, and Explanation."*
- **Mentor**, NASA International Space Apps Challenge 2023, Thessaloniki, Greece.

LANGUAGES

- **Greek**: Native Speaker / **English**: C2 / **French**: B2

SKILLS

- **Mathematics**: Probabilities, Statistics, Optimization, Calculus, Algebra
- **Python:** pyTorch, xarray, pandas, geopandas, numpy, scikit-learn, spacy
- **Earth Observation:** EO + geophysical data (MODIS, Sentinel, ERA5), Microsoft Planetary Computer, QGIS
- **Miscellaneous:** SQL, Tableau, Git, Microsoft Office, LaTeX

COURSES

Deep Learning Specialization by deeplearning.ai: Credential ID:8ULDQPFU8FEH

INTERESTS

Futsal: Futsal player (retired 2025); captain of ASE Douka and member of the Greek National Team.
Other: I like running, traveling and reading literature & history