

Bill Psomas

Résumé

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Somewhere, something incredible is waiting to be known.

Summary

Dr. Bill Psomas is a postdoctoral researcher in computer vision and machine learning. He was recently awarded the MSCA Postdoctoral Fellowship 2024 for his project Retrieval-Augmented Vision-language Models for Open-vocabulary LocalizatIon (RAVIOLI). He received his Ph.D. in September 2024 from the National Technical University of Athens (NTUA), where he defended his dissertation, Learning Visual and Multimodal Representations, under the supervision of Konstantinos Karantzalos and Yannis Avrithis. He has gained research experience through internships at leading institutes such as Inria Rennes - Bretagne Atlantique, Institute of Advanced Research in Artificial Intelligence (IARAI), and Athena Research Center. He has published 7 papers in A* venues including CVPR, ICCV, ECCV, ICLR, and NeurIPS, in addition to journal and workshop publications. Beyond research, he contributes to the academic community through reviewing, teaching, workshop organization, and student supervision.

Research Interests

Computer vision, machine learning, Image classification, image retrieval, deep metric learning, clustering, nearest neighbor search, visual and multimodal representation learning, unsupervised and self-supervised learning, object detection, localization and recognition, explainability, deep network architectures, remote sensing, generative image modeling.

Education

Degrees

- 2020–2024 **Ph.D. in Deep Learning for Computer Vision**, *National Technical University of Athens, Greece*
- 2018–2020 **MSc in "Data Science and Information Technologies"**, *National Kapodistrian University of Athens, Greece, 9.6/10*
Specialization: Big Data and Artificial Intelligence
- 2012–2018 **Diploma in Rural, Surveying and Geoinformatics Engineering**, *National Technical University of Athens, Greece, 7.38/10*
Specialization: Machine Learning for Remote Sensing

Experience

Research

- 2025– **MSCA Postdoctoral Fellow**, *Czech Technical University in Prague*, Czech Republic
- **Research Directions:**
 - Open-vocabulary segmentation.
 - Composed image retrieval.
- 2024–2025 **Postdoctoral Researcher**, *Czech Technical University in Prague*, Czech Republic
- **Research Directions:**
 - Deep network architectures.
 - Composed image retrieval.
- 2024– **Visiting Lecturer**, *National Kapodistrian University of Athens*, Greece
- **Course:** Teaching “Computer Vision” for Master of Science in “Data Science and Information Technologies”.
- 2020–2024 **Doctoral Researcher**, *National Technical University of Athens*, Greece
- **Project:** “RAMONES: Radioactivity Monitoring in Ocean Ecosystems”, FET-H2020.
 - Contributed to WP1: “Design and develop novel underwater gamma radiation instruments”.
 - Contributed to WP4: “Multi-modal data analysis and environmental modeling”.
 - **Project:** “BiCUBES: Analysis-Ready Geospatial Big Data Cubes and Cloud-based Analytics for Monitoring Efficiently our Land & Water”, HFRI.
 - Contributed to WP1: “Data Harmonization and Cloud-Free Mosaics”.
 - Contributed to WP4: “Change Detection and Time Series Analytics through Recurrent Networks”.
 - **Project:** “iTOBOS: Intelligent Total Body Scanner for Early Detection of Melanoma”, H2020.
 - Contributed to WP7: “Integration of Explainable AI for Data-Feature and Model Quality Control”.
 - Contributed to WP8: “AI-based Multimodal Data Integration”.
 - Contributed to WP9: “Integration and Technical Validation”.
 - Contributed to WP12: “Communication, Dissemination”.
 - **Project:** “eOSD: An Intelligent Early-Warning Oil Spill Detection and Prediction System for the Arabian Gulf and the Red Sea”, KAUST.
 - Contributed to T1 and T3: “Data collection, algorithm development for detection, and validation of the results”.
- 2022–2023 **Research Intern**, *Institute of Advanced Research in Artificial Intelligence*, Vienna, Austria
- Developed an attention-based pooling mechanism enhancing both convolutional networks and vision transformers.
- 2020–2020 **Research Intern**, *Inria Rennes - Bretagne Atlantique*, Rennes, France
- Developed a novel evaluation setting and a novel loss function for deep metric learning.

- 2019–2020 **Research Assistant**, *Athena Research Center*, Marousi, Attiki, Greece
- **Project:** “AdVENT: Augmented Visitor Experience in National Parks”, NSRF 2014-2020.
 - Contributed to WP4: “Development of an application for plant species recognition in forests using machine learning and computer vision techniques”.

Other

- 2020– **Computer Vision Engineer**, *Mismatch*, Patras, Greece
- Designed background subtraction algorithm for basketball court images.
 - Trained efficient object detectors for player/ball detection.
 - Developed automatic pan and zoom algorithm for camera movement.
 - Trained efficient object detectors for digit detection on basketball boards.
 - Created jersey color and jersey number datasets using vision-language models.
 - Trained models for spatio-temporal action localization.
- 2018–2019 **Software Developer**, *MaP Ltd.*, Holargos, Attiki, Greece
- Developed a coordinate recognition and drawing system.
 - Implemented CNNs for face and license plate detection and censoring.
 - Developed the CrossClimate web map application.

Miscellaneous

- 2015–2018 **Freelance Photographer**, Athens, Greece
- Photographed products for commercial use, including fashion items and other merchandise.
 - Captured interior shots for short-term rentals and real estate listings.
 - Provided professional photography services for weddings and other ceremonies.
 - Conducted photo editing and retouching to ensure high-quality final images.

Professional memberships

- 2026- European Laboratory for Learning and Intelligent Systems [ELLIS].
- 2024- Institute of Electrical and Electronics Engineers [IEEE].
- 2018- Technical Chamber of Greece [TCG].

Teaching

Independent

- 2024- **Computer Vision**, *National Kapodistrian University of Athens*, Greece

Non-independent

- 2021-2024 **Advanced Remote Sensing**, *National Technical University of Athens*, Greece
- 2023-2024 **Remote Sensing II**, *National Technical University of Athens*, Greece
- 2023-2024 **Remote Sensing I**, *National Technical University of Athens*, Greece
- 2022-2023 **Special Topics of Remote Sensing**, *National Technical University of Athens*, Greece

Supervision

Non-independent

- 2024 **Despoina Tsigarida**, *National Technical University of Athens*, Exploring Pooling Methods in Deep Metric Learning: A Performance Analysis on Benchmark Datasets
- 2024 **Eirini Baltzi**, *National Technical University of Athens*, Attentive Probing: Leveraging Attention for Improved Feature Utilization in Self-Supervised Models
- 2024 **Kalliopi Karadima**, *National Technical University of Athens*, Crater Detection on Mars using Deep Learning Techniques
- 2022 **Yannis Tsiotas**, *National Technical University of Athens*, Utilizing Self Supervised Methods in Unsupervised Metric Learning
- 2022 **Ioanna Gogousou**, *National Technical University of Athens*, Studying and Evaluating Self-Supervised Learning Methods for Image Classification

Scientific Activities

Invited Lectures/Talks

- 2025 **AI From Zero to Hero**, *Gymnázium, Praha 6, Arabská 14 Inspiration Day*, 1 hour talk
- 2025 **My MSCA Postdoctoral Fellowship Proposal Journey**, *Technology Centre Prague Workshop on MSCA PF*, 3 hour talk and workshop
- 2024 **Machine Learning for Earth Observation**, *International Geoscience and Remote Sensing Symposium Summer School [IGARSSS]*, 3 hour lecture and lab
- 2024 **Leveraging Attention in Masked Image Modeling and Pooling**, *48th Pattern Recognition and Computer Vision Colloquium [PRCVC]*, 30 minutes talk

Chair

- 2024 **Publicity Chair & Volunteers Chair**, *Greeks in AI 2025 [GAI]*
- 2024 **Session Chair at TH2.R2: Classification and Clustering II**, *International Geoscience and Remote Sensing Symposium [IGARSS]*

Organizer

- 2023 **13th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing [whispers]**, *IEEE GRSS, DLR DESIS*, Student team
- 2023 **2nd ELLIS Doctoral Symposium [EDS]**, *ELLIS Alicante*, Student team

Reviewer in journals

- 2025- **IEEE Transactions on Multimedia [TMM]**
- 2023- **International Journal of Computer Vision [IJCV]**
- 2022- **Transactions on Neural Networks and Learning Systems [TNNLS]**
- 2022- **Transactions on Pattern Analysis and Machine Intelligence [TPAMI]**

Reviewer in conferences

- 2026- **British Machine Vision Conference [BMVC]**
- 2025- **International Conference on Learning Representations [ICLR]**
- 2025- **International Conference on Computer Vision [ICCV]**
- 2025- **Conference on Artificial Intelligence [CAI]**
- 2024- **European Conference on Computer Vision [ECCV]**
- 2024- **International Geoscience and Remote Sensing Symposium [IGARSS]**
- 2023- **Conference on Computer Vision and Pattern Recognition [CVPR]**
- 2023- **Winter Applications on Computer Vision [WACV]**
- 2022- **Advances in Neural Information Processing Systems [NeurIPS]**

Grants

Independent

- 2024 **Marie Skłodowska-Curie Postdoctoral Fellowship (MSCA-PF 2024)**, *European Commission, Horizon Europe, Grant No. 10120529*, RAVIOLI: Retrieval-Augmented Vision-Language Models for Open-vocabulary Localization

Publications

Conference Papers

- [1] Tilemachos Aravanis, Vladan Stojnić, Bill Psomas, Nikos Komodakis, and Giorgos Tolias. Retrieve and segment: Are a few examples enough to bridge the supervision gap in open-vocabulary segmentation? In *Conference on Computer Vision and Pattern Recognition*, 2026.
- [2] Nikos Efthymiadis, Bill Psomas, Zakaria Laskar, Konstantinos Karantzalos, Yannis Avrithis, Ondrej Chum, and Giorgos Tolias. Composed image retrieval for training-free domain conversion. In *Winter Conference on Applications of Computer Vision*, 2025.
- [3] Ioannis Kakogeorgiou, Spyros Gidaris, Bill Psomas, Yannis Avrithis, Andrei Bursuc, Konstantinos Karantzalos, and Nikos Komodakis. What to hide from your students: Attention-guided masked image modeling. In *European Conference on Computer Vision*, 2022.
- [4] Bill Psomas, Dionysis Christopoulos, Eirini Baltzi, Ioannis Kakogeorgiou, Tilemachos Aravanis, Nikos Komodakis, Konstantinos Karantzalos, Yannis Avrithis, and Giorgos Tolias. Attention, please! revisiting attentive probing through the lens of efficiency. In *International Conference on Learning Representations*, 2026.
- [5] Bill Psomas, Ioannis Kakogeorgiou, Nikos Efthymiadis, Giorgos Tolias, Ondrej Chum, Yannis Avrithis, and Konstantinos Karantzalos. Composed

image retrieval for remote sensing. In *IEEE International Geoscience and Remote Sensing Symposium*, 2024.

- [6] Bill Psomas, Ioannis Kakogeorgiou, Konstantinos Karantzas, and Yannis Avrithis. Keep it simple: Who said supervised transformers suffer from attention deficit? In *International Conference on Computer Vision*, 2023.
- [7] Bill Psomas, George Retsinas, Nikos Efthymiadis, Panagiotis Filntisis, Yannis Avrithis, Petros Maragos, Ondrej Chum, and Giorgos Tolias. Instance-level composed image retrieval. In *Advances in Neural Information Processing Systems*, 2025.
- [8] Piera Riccio, Bill Psomas, Francesco Galati, Francisco Escolano, Thomas Hofmann, and Nuria M Oliver. Openfilter: A framework to democratize research access to social media AR filters. In *Advances in Neural Information Processing Systems*, 2022.
- [9] Simon Vellas, Bill Psomas, Kalliopi Karadima, Dimitrios Danopoulos, Alexandros Paterakis, George Lentaris, Dimitrios Soudris, and Konstantinos Karantzas. Evaluation of resource-efficient crater detectors on embedded systems. In *IEEE International Geoscience and Remote Sensing Symposium*, 2024.
- [10] Shashanka Venkataramanan, Bill Psomas, Ewa Kijak, Laurent Amsaleg, Konstantinos Karantzas, and Yannis Avrithis. It takes two to tango: Mixup for deep metric learning. In *International Conference on Learning Representations*, 2022.

Journal Articles

- [11] Elisa Arnone, George Stavridis, Livia Ortolani, Athanasios Rammos, Marco Cucchi, Anthoula Gkiourou, Sara Dal Gesso, Marco Petitta, and Bill Psomas. The drought-alert decision support system for water resources management. *Desalination and Water Treatment*, 194:304–314, 2020.
- [12] Maria Sdraka, Ioannis Papoutsis, Bill Psomas, Konstantinos Vlachos, Konstantinos Ioannidis, Konstantinos Karantzas, Ilias Gialampoukidis, and Stefanos Vrochidis. Deep learning for downscaling remote sensing images: Fusion and super-resolution. *IEEE Geoscience and Remote Sensing Magazine*, 2022.

Theses

- [13] Bill Psomas. Investigation of greek character automatic recognition methods in ancient epigraphic images, February 2018.
- [14] Bill Psomas. Metric learning: A deep dive, July 2020.
- [15] Bill Psomas. Learning visual and multimodal representations, September 2024.