Gustau Camps-Valls

Full professor
Image Processing Lab (IPL)
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Personal Information

date of birth March 8, 1972, València, Spain
current position Full professor at Dep. Eng. Electrònica, Universitat de València
Head of Image and Signal Processing (ISP) group, Universitat de València

Brief vitae

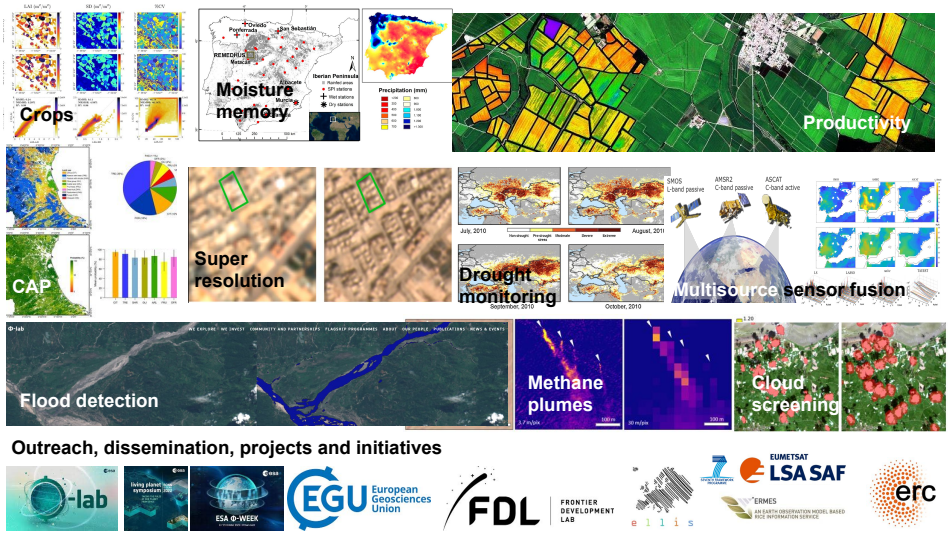
Gustau Camps-Valls, http://www.uv.es/gcamps, earned a Ph.D. degree in Physics (2002, *summa cum laude*) from the Universitat de València, where he is currently a **Full Professor in Electrical Engineering**. He lectures on time series analysis, signal processing, image processing, AI, machine learning, and remote sensing. **He is the Group Leader of the Image and Signal Processing (ISP) group, http://isp.uv.es, an interdisciplinary group of 50 researchers working at the intersection of AI and machine learning for Earth and Climate sciences.** His research focuses on developing novel AI algorithms for monitoring the planet, understanding processes, and addressing extreme events to promote sustainability. He coordinates several European projects and consults for ESA, EUMETSAT, and NASA. He has held visiting positions at Univ. Trento (Italy), Max Planck Institute (Germany), and EPFL (Switzerland).

Prof. Camps-Valls has published **300 journal papers, 300+ conference papers, 25 chapters, and edited 6 books** on AI, remote sensing, and machine learning. He has an **h-index of 96 in Google Scholar with 43,000+ citations**. He was listed as a **Clarivate Highly Cited Researcher** (2011, 2021-2023), and his kernel methods work was recognized by Thomson Reuters ScienceWatch as **Fast Moving Front research** in Engineering. **More than 5 of his papers have received 1000+ citations each**, and a kernel-based information fusion paper won the **Google Classic Paper Award**. His work has appeared in *Nature, Nature Communications, Science Advances*, and *PNAS*.

He is a referee and Program Committee member of many international journals and conferences. He served as **Technical Program Chair at IEEE IGARSS 2018** and **General Chair of AISTATS 2022**. Since 2007, he has been a member of the IEEE Data Fusion and MLSP Technical Committees, and he has served as Associate Editor for several IEEE journals. He was also part of the **MTG-IRS Science Team** at EUMETSAT. Since 2019, he has been an **ELLIS Fellow**, coordinating the **'Machine Learning for Earth and Climate Sciences'** research program at ELLIS.eu and the **AI Doctoral Academy (i-AIDA)**. He was an **IEEE Distinguished Lecturer** (2017-2019) and is actively involved in the ITU AI4Good seminar series. In 2018, he was elevated to **IEEE Fellow in two Societies** (Geosciences and Signal Processing). Since 2019, he has been an **Invited Professor Fellow at ESA PhiLab**. In 2021, he became a **board member of the European Science Foundation** and, in 2022, was elevated to **Fellow of the European Academy of Sciences (EurASc)** and the **Academia Europaea (AE)**. **He has received two ERC grants:** an ERC Consolidator Grant (2015) and an ERC Synergy Grant (2019) to advance AI for Earth and Climate Sciences.

Research interests and focus

My research interests revolve around the central topic of *'AI for Earth and sustainability science'*. I focus on 1) *interdisciplinary research* that advances physics-aware and causal ML; 2) *transfer of knowledge and solutions* to the European (e.g. ESA, EUMETSAT, ESSC/ESF) and international remote sensing and signal processing (IEEE, SPIE), geosciences (EGU, AGU) and aerospace (ESA, NASA) communities, computing industry (Google, Microsoft), and the Society (iDMC, ITU AI4Good, UN/WFP); and 3) *engagement with high-level education on AI* via European excellence networks (ELLIS, CLAIRE) and international doctoral programs (i-AIDA, Marie Curie ETNs).
We address Sustainable Development Goals 2 (Zero Hunger), 6 (Clean Water and Sanitation), 10 (Reduced Inequalities), 11 (Sustainable Cities and Communities), 13 (Climate Action), and 15 (Life on Land) by developing AI-driven solutions to improve food security, monitor water resources, reduce environmental inequalities, enhance urban sustainability, mitigate climate impacts, and protect terrestrial ecosystems. We enhance the detection, prediction and attribution of extreme events such as droughts, heatwaves, and floods by integrating AI with Earth system models. Leveraging vast satellite data, climate models, and domain knowledge, we estimate and forecast key climate variables across all spheres: esimation of crucial biophysical parameters like carbon sinks and crop yields in the biosphere; AI to improve the estimation of temperature, humidity, and gases, aiding climate understanding in the atmosphere; AI tools to monitor ocean health and rising sea levels in the hydrosphere; and explainable and causal AI to address socio-economic and humanitarian issues, including climate-induced migration and food insecurity, in the anthroposphere.



Degrees/Academics/Education

PhD Physics.	Universitat de València, September 2002.
MSc. Physics.	Universitat de València, June 2000.
Bsc. Elec. Engin.	Universitat de València, July 1998.
BSc Physics.	Universitat de València, July 1996.

Languages

Catalan	Native bilingual proficiency
Spanish	Bilingual proficiency
English	Full professional proficiency
Italian	Correct
French	Basic

Positions and Professional Experience

Academic at the Universitat de València, Spain

10.2017–	Full Professor, Catedrático
10.2009–10.2018	PhD Program coordinator. Electrical Eng. Dept. http://die.uv.es
10.2008–	Head of 'Image and Signal Processing Group', http://isp.uv.es
10.2007–10.2008	Associate professor. Electrical Eng. Dept. http://die.uv.es
10.2002–09.2007	Tenure Track - Postdoc. Assist. Prof.
10.1998–09.2002	Assistant professor.

Visiting Researcher / Invited Professor

05.2018–07.2018	Max Planck Institute for BioGeoChemistry, Jena, Germany.
05.2016–10.2016	Max Planck Institute Intelligent Systems, Tübingen, Germany.
05.2013–07.2013	École Polytechnique Fédérale de Lausanne, Switzerland.
05.2009–10.2009	Max Planck Institute Intelligent Systems, Tübingen, Germany.
05.2004–10.2004	Università degli Studi di Trento, Italy.
05.2001–11.2001	Universidad Carlos III de Madrid, Spain.

Honors, Awards & Recognitions

2024	IEEE GRSS David Landgrebe Award
2023	Highly Cited Researcher in the field of Geosciences (since 2020)
2023	Top 2% World Cited Researchers in 2020-2023 (Stanford University Ranking)
2022	Fellow Member of Academia Europeae
2022	Fellow Member of European Academy of Sciences
2021	Fellow Member of Asia-Pacific Artificial Intelligence Association (AAIA)

2021 Member of the European Space Sciences Committee of the European Science Foundation
2020 ERC Synergy Grant (ERC-SyG) 2020 (10M€, with V. Eyring, M. Reichstein, P. Gentine)
2019 ELLIS Fellow Member
2019 Fellow advisor European Space Agency (ESA) - Φ-Lab
2018 Elevation to "IEEE Fellow" (in both GRSS and SPS societies)
2017 Elevation to "IEEE Distinguished Lecturer" (GRSS chapter)
2015 ERC Consolidator Grant (ERC-CoG) 2015
2011 Thomson Reuters Essential Science Indicators: most-cited paper in Engineering in 2011

Significant Leadership and Service Positions

Book ed. "Deep Learning for the Earth Sciences" (Wiley & sons, 2021).
Book ed. "Digital Signal Processing with Support Vector Machines" (Wiley & sons, 2017).
Book ed. Sensing Image Processing" (Morgan & Claypool Publishers, 2011).
Book ed. "Kernel methods for remote sensing data analysis" (Wiley & sons, 2009)
Book ed. "Kernel methods in bioengineering, signal and image processing" (IGI, 2007)
Associate Editor "IEEE Transactions on Signal Processing"
Associate Editor "IEEE Signal Processing Letters"
Associate Editor "IEEE Geoscience and Remote Sensing Letters"
Associate Editor "ISRN Signal Processing Journal"
Guest Editor "IEEE Journal of Selected Topics in Signal Processing"
Guest Editor "IEEE Geoscience and Remote Sensing Magazine"
Guest Editor "Sensing and Imaging (Springer)"

Professional Memberships

Fellow Member Academia Europeae (AE) (2022–)
Fellow Member European Academy of Sciences (EurASc) (2022–)
Fellow Member Asia-Pacific Artificial Intelligence Association (AAIA) (2021–)
Advisor Com European Science Foundation (ESF) - Earth/Space branch (2021–)
Member Association for Computing Machinery (ACM) (2021–)
Fellow Member ELLIS - European Laboratory for Learning and Intelligent Systems (2019–)
Fellow Member IEEE, in both Geosciences and Signal Processing societies (2018–)
Member International Society for Optical Engineers (SPIE) (2018–)
Senior Member IEEE (2007–)
Member Association for Computing Machinery (SP) (2021–)
Advisor Com European Space Agency (ESA) - Φ-Lab (2019–)
Member American Geophysical Union, AGU (2017–)
Member European Geosciences Union, AGU (2017–)
Member Data Fusion Technical Committee of the IEEE Geosc. Rem. Sens. Soc. (2009–)
Member Machine Learning for Signal Processing Technical Committee of the IEEE-SPS (2009–2014)

Selected research funding (∼8M€ as PI).

Past Funded Projects and Contracts

11/99–11/00 System for the analysis of heart rate variability and ventricular recovery duration. Generalitat Valenciana. Project Code: 'Medical Information Processing'. GR00-28. 180k€

06/99–06/01 Development of neural systems for application in pharmaceutical care. Funding: FEDER Funds. Project Code: 1FD1997-0935. 31,252€

09/01–12/02 Evaluation of artificial intelligence algorithms for the classification and prediction of user behavior on a web portal. Funding: Ministry of Science and Technology. Project Code: FIT-070000-2001-663. 4,000,000€

11/01–11/02 Development of neural systems for use as pharmacokinetic models. Funding: Universitat de València (Pre-Competitive Projects). Project Code: UV01-15. 980,000€

01/01–12/01 Development of a domiciliary cardiac monitoring system for depressed social groups using cable information services and conventional telephone network. Funding: National Programs for Information and Communication Technologies and Information Society. Project Code: FIT-070100-2001-19. 108,182€

11/01–11/02 Study of Ventricular Fibrillation detection using time-frequency techniques, wavelets, and neural networks with real-time hardware implementation for clinical diagnosis. Funding: Universitat de València (Pre-competitive Projects). Project Code: UV01-14. 9,000€

11/99–11/00 Advanced neural systems for application in pharmacokinetics. Funding: Generalitat Valenciana. Project Code: CTIDIA/2002/166. 9,349€

10/03–11/03 SMARTSPECTRA. Funding: Office of Science and Technology of the Presidency of the Generalitat Valenciana. Special Actions I+. Project Code: CTIAE/A/03/169. 6,000€

12/01–09/05 Study of sensory integration techniques and development of electronic and image sensors for the phytosanitary quality control of fruits in postharvest processing centers. Funding: Ministry of Science and Technology. Project Code: DPI2001-2956-C02-01. 81,737€

07/02–07/05 Smart Multispectral System for Commercial Applications (SMARTSPECTRA). Funding: European Union, Framework Programme. Subprogram: "Information Society Technologies". Project Code: 2001/C321/17. 366,630€

12/04–12/05 Contribution to the design of future ESA Earth observation missions through optimized use of new hyperspectral sensors (HYPERTEL). Funding: CICYT, Ministry of Science and Technology. Project Code: Subproject ESP2004-06255-C05-02. 33,300€

01/05–12/05 Aids for research groups 2005. Funding: Generalitat Valenciana. Project Code: GRUPOS2005/003. 27,000€

01/06–12/07 Classification of hyperspectral remote sensing images based on semi-supervised kernel methods. Funding: Spain-Italy Integrated Action. Project Code: MEC/HI2005-0228. 11,000€(Spain) + 9,000€(Italy)

01/06–12/06 HYPERCLASS: Advanced methods for hyperspectral image classification. Funding: Emerging Groups, Generalitat Valenciana. Project Code: GV2005-011. 29,700€

01/06–12/07 Support Vector Machines and computational models of human vision for image coding and restoration. Funding: Emerging Groups, Generalitat Valenciana. Project Code: GV2006/215. 8,600€

01/07–12/07 RVRF: Valencian Network for Pattern Recognition and Machine Learning. Funding: Generalitat Valenciana. Project Code: AE/2007/103. 2,500€

12/05–12/08 Development of an integrated hyperspectral Earth observation data system applied to the design of future ESA missions. DATASAT. Funding: CICYT, Ministry of Science and Technology. Project Code: Subproject ESP2005-07724-C05-03. 50,000€

12/06–12/09 Integration of nonlinear perceptual and statistical representations in image restoration and coding. Funding: CICYT, Ministry of Science and Technology. Project Code: TEC2006-13845/TCM. 68,600€

11/08–11/11 Observation of the Earth: Calibration of optical data and information extraction (EODIX). Funding: Ministry of Education and Science. VI National Plan for Scientific Research, Development, and Technological Innovation 2008-2011. Project Code: AYA2008-05965-C04-03. 187,000€

10/07–09/12 MIPRCV: Multimodal Interaction in Pattern Recognition and Computer Vision. Funding: Consolider-Ingenio, Ministry of Science and Innovation (MCINN). Project Code: CONSOLIDER/CSD2007-00018. 604,800€

09/09–12/12 Statistics of Natural Images: Non-parametric Learning, Bayesian Models, and Computational Neuroscience for Image Processing. Funding: CICYT, Ministry of Science and Technology. Project Code: TEC2009-13696/TEC. 35,200€

01/13–12/13. RE-using field reference data in space and time for vegetation mapping: the potential of semi-supervised and active LEARNing techniques. P. Scheunders, G. Camps-Valls (co-PI). *20K€*

01/12–01/14 FLEX/S3 Tandem Mission Performance Analysis and Requirements Consolidation Study. 295K€

11/11–11/14 Sustainable Computing and Communications. Funding: MicroClusters de Investigación (VLC-Campus de Excelencia Research Structures). 32,611€

11/11–11/14 Multimodal Interaction in Intelligent Systems. Funding: MicroClusters de Investigación (VLC-Campus de Excelencia Research Structures). 64,300€

06/15–06/18 Advances in Machine Learning for Large Scale Remote Sensing Data Processing. MINECO. 80K€

01/15–07/15 Study on pattern recognition based cloud detection over landmarks. EUMETSAT. PI. 65K€

01/14–12/14 Improvement of the current nonlinear regression retrieval (NLR) implemented within the MTGIRS prototype processor for monitoring (MTGIRS L2 PPM) to generate whole globe profiles of temperature, water vapour and ozone. EUMETSAT. PI. 85K€

01/13–12/15 LIFE-VISION: Learning Image Features to Encode Visual Information. Spanish Ministry of Economy and Competitiveness, 2012. TIN2012-38102-C03-01. PI. 104K€

01/13–12/15 FLUXCOM: An initiative to upscale biosphere-atmosphere fluxes from FLUXNET sites to continental and global scales. Funding: Max Planck Society. Project Code: FLUXCOM-MPI. 190,000€

01/13–12/15 SenSyF: Sentinels Synergy Framework. EU (FP7-Space). J. Moreno, G. Camps-Valls (co-PI). FP7-SPA.2012.1.1-05. 141K€

01/13–12/16 Mapping and the citizen sensor. ICT COST Action. Member of the Management Committee.

01/13–01/16 KERMES: Advances in Kernel Methods for Structured Data. Funding: MINECO, Spanish Ministry of Economy and Competitiveness. Project Code: TEC2016-81900-REDT, Network of Excellence. 20,000€

06/15–06/19 Next Generation Kernel-Based Machine Learning for Big Missing Data Applied to Earth Observation. Funding: Norwegian Research Council. Grant no. 238944. 946,267€

09/15–08/20 SEDAL: Statistical Learning for Earth Observation Data Analysis. Funding: ERC Consolidator Grant (ERC-CoG), EC Excellence Science. 1.72 M€

06/17–06/20 CLOUDSAT: Cloud Screening of Satellite Images. MINECO. 272K€

09/20–08/24 ELISE: European Learning And Intelligent Systems Excellence. ICT-48, Universitat de València. 12M€, UV: 230k€

01/21–12/23 DeepCube: Explainable AI pipelines for big Copernicus data. EU H2020, 2021-2024 4M€, UV: 450K€)

01/20–06/24 iMIRACLI: innovative MachIne leaRning to constrain Aerosol-cloud CLimate Impacts. ETN Marie Curie Training Network. 2M€, UV: 250K€

06/20–06/24 SCALE: Causal inference in the human-biosphere coupled system (SCALE). Fundación BBVA. 68K€

01/21–12/23 DeepCube: Explainable AI pipelines for big Copernicus data. EU H2020, 2021-2024 4M€, UV: 450K€

01/21–12/23 DeepExtremes: DeepExtremes: Multi-Hazards, Compounds and Cascade events, G. Camps-Valls, 01/02/22 AI for Science. ESA, 2022-2024 400k€, UV: 90k€

01/21–12/23 OpenSR: Robust, accountable super-resolution for Sentinel-2 and beyond. Towards Explainable AI: Application to Trustworthy Super-Resolution, L. Gomez, G. Camps-Valls (coPI) 01/02/22. ESA, 2022-2024 1M€, UV: 300k€

On-going Funded Projects and Contracts:

09/20–08/26 Understanding and Modeling the Earth System with Machine Learning. ERC Synergy grant. PI (with Eyring, Reichstein and Gentine). 9,89M€, UV: 2.3M€

09/21–10/25 XAIDA: Extreme AI for Detection and Attribution. EU H2020, 2021-2024 4M€, UV: 350K€

05/22–05/25 Causal4Africa: Causal Inference to Understand the Impact of Humanitarian Interventions on Food Security in Africa. Microsoft Research - Microsoft Climate Research Initiative, Universitat de València: G. Camps-Valls (PI), G. Varando (Co-PI), JM. Tarraga (Scientific Researcher), University of Reading: T. Shepherd (PI), R. Cornforth (Co-PI), 2022-2024.

01/22–31/25 AI for complex systems: Brain, Earth, Climate, Society. Generalitat Valenciana - Regional Ministry of Education, Research, Culture and Sport under PROMETEO programme. G. Camps-Valls, M. Piles. 600k€

01/22–31/25 HERMES: Hybrid Estimation and Remote Sensing Monitoring of Evaporation and Soil Moisture. BELSPO Stereo IV Research program, 2023-2025. Diego Miralles (Uni Ghent), Miguel Mahecha (Uni Leipzig), Gustau Camps-Valls and Alvaro Moreno (Uni València). 280k€

09/23–08/26 ELIAS: European Lighthouse of AI for sustainability. HORIZON-RIA. N. Sebe, UV: G. Camps-Valls (PI) 13M€, UV: 350k€

01/24–01/27 THINKINGEARTH: Copernicus Foundation Models for a Thinking Earth. HORIZON-RIA. I. Papoutsis, UV: G. Camps-Valls (PI) 6M€, UV: 450k€

04/24–04/27 AI4PEX: Artificial Intelligence and Machine Learning for Enhanced Representation of Processes and Extremes in Earth System Models. HORIZON-RIA. N. Carvahails, UV: G. Camps-Valls (PI) 8M€, UV: 550k€

09/24–03/27 MediTwin: Mediterranean Digital Twin Network for Understanding Climate Extremes. HORIZON-RIA. Universitat de València (UVEG), UV PI: Gustau Camps-Valls, 2024-2027 2M€, UV: 300k€

Technology transfer

- It is a common practice in the group to include software solutions or toolboxes as a delivery product in projects, (see ISP web site) and delivered advanced AI methods and tools to ESA and EUMETSAT as a preparation of future satellite missions.
- Coordinator of the ELLIS research program 'Machine Learning for Earth and Climate' to define the European scientific agenda in these topics, and ot foster adoption and transfer of AI to industry and society.
- Consultant on data science for the venture capital 'Synóptikos'.
- Advisory committee and consultant of ESA PhiLab on 'AI4Earth'.
- Patent: "Method, apparatus and software for color image compression based on non-linear perceptual representations and machine learning", J Malo, J Gutiérrez, G Camps-Valls, and MJ Luque. 06/20/2008. Ref. P200801943.

Organizing committees & Services

TPC/AC	IGARSS, IWANN, SPIE RSS, IEEE MLSP, IEEE-MULTITEMP, IEEE CISP, ICANN, IEEE WCNC, ICPRAM, ICANN, ICML, NeurIPS, ICLR, AISTATS, UAI,...
Session Chair	IEEE IGARSS, IEEE ICIP, IEEE MLSP.
Technical Chair	IEEE IGARSS 2018, València (2400 attendees)
General Chair	IEEE MLSP 2012. Santander; AISTATS 2022, València; PGM2026 València

Reviewer Activities & Services

Conferences	MLSP, EUSIPCO, ICASSP, IWANN, ICANN, CIP, ICIP, IGARSS, SPIE, AAAI, ICML, NIPS, ECML, KES, Whispers, Urban, ICPRAM, ICML, NeurIPS, ICLR, AISTATS, UAI, etc.
Journals	IEEE Geoscience and Remote Sensing Magazine, IEEE Transactions on Geoscience and Remote Sensing, IEEE Geoscience and Remote Sensing Letters, IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, IEEE Signal Processing Magazine, IEEE Journal of Selected Topics in Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Neural Networks, IEEE Transactions on Pattern Analysis and Machine Intelligence, Journal of Machine Learning Research, Pattern Recognition, Neurocomputing, Remote Sensing of Environment, Machine Learning, Information Fusion, Signal Processing, Journal of the Optical Society of America, Applied Optics, Mathematical Reviews, International Journal of Remote Sensing, PLOS One, Nature, Nature Communications, Nature Climate Change, Science Advances, PNAS
Book Proposals	IGI Inc., Springer-Verlag, IOS Press, Wiley & Sons.
Projects	Swiss National Science Foundation (SNSF), Belgian Science Foundation, European Space Agency (ESA), Spanish National Research Programme, Romanian National Council for Research and Development, the Hong Kong Strategic Research funding programme, Finish council, H2020 SPACE, H2020 FET, H2020 Marie Curie, PRIMA, ERC StG and ERC CoG, Max Planck Society, CNR, CIMA, etc.
Advisory board	Meteosat Third Generation - Infrared Sounder (MTG-IRS) Mission Advisory Group of EUMETSAT (2010–), H2020 projects, Consultant of ESA PhiLab on 'AI4Earth', and Evaluation panel of new research groups in France, Switzerland, Netherlands and Germany.

Publications

- Google Scholar: $h = 96$, 43000+ cites
- Google Scholar | Publons | ORCID | ResearchGate

Relevant papers

1. "Kernel-based methods for hyperspectral image classification", *Camps-Valls, G. et al.*, IEEE Trans. Geosci. Remote Sens., 2005.
2. "Composite kernels for hyperspectral image classification", *Camps-Valls, G. et al.*, IEEE Geosci. Remote Sens. Lett., 2006.
3. "Semi-supervised graph-based hyperspectral image classification", *Camps-Valls, G. et al.*, IEEE Trans. Geosci. Remote Sens., 2007.
4. "Advances in hyperspectral image classification", *Camps-Valls, G. et al.*, IEEE Signal Process. Mag., 2014.
5. "Unsupervised deep feature extraction for remote sensing classification", *Romero, A. et al.*, IEEE Trans. Geosci. Rem. Sens., 2016.
6. "Deep learning and process understanding for data-driven Earth System Science", *Reichstein, M. et al.*, Nat., 2019.
7. "Inferring causation from time series with perspectives in Earth system sciences", *Runge, J. et al.*, Nat. Commun., 2019.
8. "A Unified Vegetation Index for Quantifying the Terrestrial Biosphere", *Camps-Valls, G. et al.*, Sci. Adv., 2021.
9. "Emergent vulnerability to climate-driven disturbances in European forests", *Forzieri, G. et al.*, Nat. Commun., 2021.
10. "Discovering causal relations and equations from data", *Camps-Valls, G. et al.*, Phys. Rep., 2023.
11. "Causal inference for time series", *Runge, J. et al.*, Nat. Rev. Earth Environ., 2023.
12. "Exploring interactions between societal context and natural hazards", *Ronco, M. et al.*, Nat. Commun., 2023.
13. "AI for Extreme Events Modeling and Understanding: Methodologies and Challenges", *Camps-Valls, G. et al.*, Nat. Commun., 2024.
14. "AI-empowered Next-generation Multiscale Climate Modeling for Mitigation and Adaptation", *Eyring, V. et al.*, Nat. Geosci., 2024.
15. "Causal machine learning for sustainable agroecosystems", *Sitokonstantinou, V. et al.*, Nat. Food, 2024.
16. "Early warning of complex climate risk with integrated artificial intelligence", *Reichstein, M. et al.*, Nat. Commun., 2024.
17. "Digital twins of the Earth with and for humans", *Hazeleger, W. et al.*, Nat. Commun. Earth Environ., 2024.
18. "Information Theory Measures via Multidimensional Gaussianization", *Laparra, V. et al.*, IEEE Trans. Patt. Anal. Mach. Intell., 2024.
19. "Towards data-driven discovery of governing equations in geosciences", *Song, W. et al.*, Nat. Commun. Earth Environ., 2024.
20. "Collaboration between artificial intelligence and Earth science communities for mutual benefit", *Chen, M. et al.*, Nat Geosci., 2024

Invited talks, lectures and courses

Intnl. Tutorials	MLSP-2014, IEEE-Whispers, ESA course, IEEE-IGARSS-2015
Session Chair	IEEE IGARSS 2006-2015, IEEE ICIP 2009, SPIE Remote sensing 2007-2013, MLSP 2009-2012
Keynote Speaker	IGARSS, SPIE, StatLearn, SIU, NOBIM, and many more ...
IEEE DL	IEEE Distinguished Lecturer, 2017-2019, involving many talks worldwide in China, India, Germany, Switzerland, Brasil, Canada, ...
Invited talks	More than 100 invited talks at conferences and workshops, http://isp.uv.es/talks.html

PhD Thesis Supervision

I supervised $40+$ master students in the last decade and $10+$ PhD students (currently (co)advising 15 PhDs). The theses span a wide range of topics in ML, remote sensing, and Earth sciences, focusing on the development and application of advanced algorithms for environmental monitoring and analysis. Key themes include semi-supervised and kernel-based methods for hyperspectral image classification and detection, cloud screening and target detection, as well as advancements in biophysical parameter retrieval and anomaly detection. Recent work emphasizes integrating physics modeling with machine learning, ML-driven climate model parametrization, causal inference and equation discovery, and spatio-temporal data analysis to address pressing global challenges such as crop yield prediction, sea-level forecasting, drought detection, and food insecurity. These theses collectively push the boundaries of AI and machine learning for Earth and climate science, contributing to our understanding of environmental processes and the impacts of climate change. In the last 5 years I was member of examination committees for 20 PhD students in Europe (EPFL, Paris Mines, Tromsø, Madrid, Trento, etc). Several of the alumni, visitors and early career scientists established an influential career in various areas of remote sensing data analysis.

Main collaborators

Through the years I collaborated with 100+ researchers of a wide variety of fields, from remote sensing and geosciences, to atmospheric sciences, ecology, climate sciences, mathematics, computer science, electrical engineering.

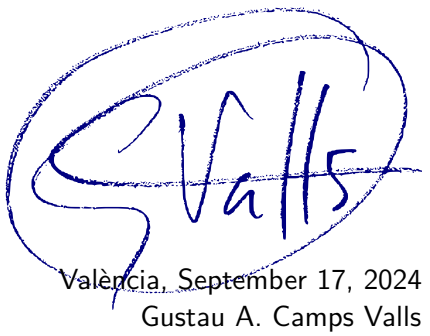
- Bernhard Scholkopf, MPI Tübingen
- Dino Sejdinovic, Uni Oxford, UK
- Robert Jenssen, Uni Tromsø
- Jonas Peters, ETHZ
- Markus Reichstein, MPI Biogeochemistry, Jena, Germany
- Veronika Eyring, DLR, Germany
- Pierre Gentine, Columbia University, USA
- Steve Running, NTSG, Uni Montana, USA
- Miguel Mahecha, Uni Leipzig, DE
- Sebastian Sieppel, ETH Zurich, CH
- Jakob Zscheischler, Helmholtz Centre for Environmental Research - UFZ, Leipzig, Germany
- Jakob Runge, DLR, Germany
- Lorenzo Bruzzone, UNITN, Italy
- Devis Tuia, EPFL, CH
- Diego Miralles, Uni Ghent, Belgium

Major collaborators, organizations, companies and networks in https://isp.uv.es/collaborators.html.

Media coverage

EurekaAlert on ERC	Using AI to better understand and model the earth system
Sciencex, Wire	Artificial intelligence and big data provide the first global maps on key vegetation traits, coverage of our Nature paper.
Techxplore	Generalization of all vegetation indices, coverage of Science Advances paper.
Phys.org	Researchers predict sea level changes along many coasts around the globe, coverage of our Nature paper.

Phys.org	Artificial intelligence and big data provide the first global maps on key vegetation traits, coverage of our Nature paper.
ITU on AI	Gustau Camps-Valls, Markus Reichstein, Joachim Denzler, and Maria Piles coordinate the cycle "AI for Earth and Sustainability Science" within the actions AI for Good of the ITU.
ESA-EGU 2023 Team Award	The group led by Gustau Camps-Valls from the University of Valencia in Spain is a finalist for the ESA-EGU 2023 team award, for their work on the development of novel Artificial Intelligence methods to analyze Earth observation data, with the goal of modeling and understanding the complex interactions between the various components of the Earth system.
ELISE	The ISP participates in the ELISE project actively, and contributes to the ELISE vision for the next generation of AI for Europe. In particular, on ELISE's Strategic Research Agenda and trends in AI
The Conversation	Prof. Camps-Valls publishes an article warning of the limitations of current AI, and advocates incorporating domain knowledge and the laws of Physics, making greater efforts in the explainability of the models, and in causal inference.
ABC	Algorithms to Predict Famines in Africa
Valencia Plaza	A Method to Measure Earth Constants and Determine if Causes are Natural or Anthropogenic
Sinc Agency	European Forests are Increasingly Vulnerable to Wind, Fires, and Insect Plagues
EFE	AI and Big Data Maps of Vegetation, Water, and Climate
Prensa Ibérica	Four Scientists from Universitat de València Among the Global Elite
Earth news	Physics and AI to Advance Understanding of Climate and Earth Phenomena
OK diario	Europe to Boost AI Against Climate Change with Focus on the Mediterranean
Prensa Ibérica	ISP Hosts Experts in Extreme Weather Events and Algorithm Applications in València
ELLIS.eu	AI for Understanding Extreme Events
Fund Cañada	AI for Sustainability
Valencia Plaza	Prof. Camps-Valls is a New Member of the European Academy of Sciences and Academia Europaea
Prensa Ibérica	Highly Cited Researcher 2022



València, September 17, 2024
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