Gustau Camps-Valls

Full professor
Image Processing Lab (IPL)
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Personal Information

date of birth	March 8th, 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, and he is currently **Full Professor in Electrical Engineering** in the same university, where he lectures time series analysis, signal processing, image processing, AI and machine learning, and advanced remote sensing data processing. **He is the Group Leader of the Image and Signal Processing (ISP) group, http://isp.uv.es, an interdisciplinary group of 50+ resarchers working in the intersection of AI and machine learning for Earth and Climate sciences. His research interests involve the development of novel AI algorithms for better monitoring our planet from space, understanding the processes and extreme events, and achieving a sustainable Earth. He currently coordinates several European projects in these areas, and assists/ed the aerospeace industry (ESA, EUMETSAT, NASA) as consultant and member of Advisory Boards.** He has been Visiting Researcher at the Remote Sensing Laboratory (Univ. Trento, Italy) in 2002, the Max Planck Institute (Tübingen, Germany) in 2009 and 2016, and as Invited Professor at the EPFL (Lausanne, Switzerland) in 2013, and at MPI (Jena, Germany) in 2018.

Gustau is interested in **developing AI and causality methods to tackle relevant environmental and societal problems.** From detecting and forecasting extreme events (like droughts, heatwaves and floods), to improve Earth models with AI emulation and novel parameterizations, as well as explaining complex systems like the interconnected Earth with causality and equation discovery. He loves tackling crucial challenges in Earth and climate sciences using and developing methods of modern AI. **Get a visual feeling of his research in this ISP presentation video.**

Prof. Camps-Valls research activities have resulted so far in around **300 peer-reviewed international journal papers, 400 international conference papers, 25 chapters, and in editing 6 books on remote sensing, image processing and machine learning**: "Kernel methods in bioengineering, signal and image processing" (IGI, 2007), "Kernel methods for remote sensing data analysis" (Wiley & Sons, 2009), "Remote Sensing Image Processing" (MC, 2011), "Digital Signal Processing with Kernel Methods" (Wiley & Sons, 2018), and "Deep Learning for the Earth Sciences" (Wiley & Sons, 2021). **He has a h-index of 100 in Google Scholar, with 45000+ citations, from which 25000+ were received in the last 5 years.** He was listed as a Clarivate Highly Cited Researcher in 2011, 2021, 2022 and 2023, and Thomson Reuters ScienceWatch identified my activities as Fast Moving Front research as the Essential Science Indicators identified me as the author of the most-cited paper in the area of Engineering in 2011. That was the seminal work about the introduction of kernel methods to the remote sensing and geoscience community. **More than 5 papers received 1000+ citations each, and a paper about information fusion with kernels received the Google Classic paper award.** He has published seminal papers in Nature, Nature Communications, Science Advances, and PNAS.

He is a referee and Program Committee member of many international journals and conferences. He has served on the Program Committees of International Society for Optical Engineers (SPIE) Europe, International Geoscience and Remote Sensing Symposium (IGARSS), Machine Learning for Signal Processing (MLSP), and International Conference on Image Processing (ICIP) among others. He was the Technical Program Chair at IEEE IGARSS 2018, València (2400+ attendees), and the General Chair of AISTATS 2022, València. Since 2007 he is member of the Data Fusion technical committee of the IEEE GRSS, and of the MLSP TC of IEEE SPS. He is (or has been) Associate Editor of "IEEE Trans. Sig. Proc.", "IEEE Sig. Proc. Lett.", "IEEE Geosc. Rem. Sens. Lett.", and Guest Editor of "IEEE Jour. Sel. Topics in Sig. Proc.". **He was member of the MTG-IRS Science Team (MIST) of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT).** Prof. Camps-Valls is habitual evaluator of project proposals for H2020 programs (ERC, FET), NSF, China Science Foundation, Swiss Science Fundation, etc.

Since 2019 he is an ELLIS Fellow and coordinates the 'Machine Learning for Earth and Climate Sciences' research program of ELLIS.eu and fundational node of the AI Doctoral Academy (i-AIDA) for the advancement of AI in Europe. Prof. Camps-Valls was included in the prestigious IEEE Distinguished Lecturer program of the IEEE GRSS (2017-2019), and is deeply involved in the ITU AI4Good seminar series for dissemination of AI and sustainability. Other dissemination activities are more regional, like the active participation in valgrAI, which coordinates AI training and research in the Valencia autonomous region.

In 2018 he was elevated to IEEE Fellow in two Societies (Geosciences and Signal Processing, in 2018), since 2019 he is an Invited Professor Fellow of the ESA PhiLab, since 2021 acts as board member of the European Science Foundation advising ESA, EU and national space agencies, and in 2022 was elevated to Fellow of the European Academy of Sciences (EurASc), the Academia Europeae (AE), and the Asia-Pacific Artificial Intelligence Association (AAIA). **Prof. Camps-Valls has received two European Research Council (ERC) grants in two different areas: an ERC Consolidator grant on "Statistical learning for Earth observation data analysis" (2015) and an ERC Synergy grant on "Understanding and Modelling the Earth system with machine learning" (2019) to advance AI for the Earth and Climate Sciences.**

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	Mother tongue
Spanish	Native Speaker
English	Equivalent to Native Speaker (C2)
Italian	Basic knowledge (B2)
French	Basic knowledge (B1)

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.

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€

On-going Funded Projects and Contracts:

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€)

01/20–12/24 iMIRACLI: innovative MachIne leaRning to constrain Aerosol-cloud CLimate Impacts. ETN Marie Curie Training Network. 2M€, UV: 250K€

06/20–06/23 SCALE: Causal inference in the human-biosphere coupled system (SCALE). Fundación BBVA. 68K€

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€

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€

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

05/22–05/24 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€
07/25–08/28	ELLIOT: European Large Open Multimodal Foundation Models for Scalable Robust Generalization. CL4-2024-HUMAN-03-01-2024. Universitat de València (UVEG), UV PI: Gustau Camps-Valls, 2024-2027 50M€, UV: 1M€

Technology transfer

- It is a common practice in the group to include software solutions or toolboxes as a delivery product in projects, cf. http://isp.uv.es/software.html, and delivered advanced AI methods and toolsto ESA, EUMETSAT and NASA as a preparation of future satellite missions.
- Some computational improvements in classification methods for remote sensing have been included in official ESA products, such as BEAM-The ENVISAT-MERIS and AATSR Toolbox, http://www.brockmann-consult.de/beam/.
- 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 and conference reviewer

Technical/Program committee	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.
Keynote Speaker	SPIE conference on Remote Sensing 2011, Prage, Czech Rep., NOBIM Norwegian conf on machine learning and pattern recognition.
Technical Chair	IEEE IGARSS 2018, València (2400 attendees)
General Chair	IEEE MLSP 2012. Santander; AISTATS 2022, València

Editorial activities

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)"

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 (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)

Reviewer Activities & Services

Conferences	MLSP, EUSIPCO, ICASSP, IWANN, ICANN, CIP, ICIP, IGARSS, SPIE, 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.

Awards & Recognitions

2024 IEEE GRSS David Landgrebe Award
2023 Highly Cited Researcher in the field of Geosciences
2023 18 InCites "Highly Cited Papers" + 5 "Research Front Papers"
2022 ESA-EGU Excellence Award for Research Groups in Europe (Finalist)
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
2022 Highly Cited Researcher in the field of Geosciences
2021 Fellow Member of Asia-Pacific Artificial Intelligence Association (AAIA)
2021 Highly Cited Researcher in the field of Geosciences
2021 Member of the European Space Sciences Committee of the European Science Foundation
2020 InCites TM: 6 papers ranked as Essential Science Indicators and 1 Hot Paper
2020 ERC Synergy Grant (ERC-SyG) 2020 (10M€, with V. Eyring, M. Reichstein, P. Gentine)
2018 Elevation to "IEEE Fellow" (in both GRSS and SPS chapters)
2018 InCites: Four papers ranked as Essential Science Indicators
2017 Best Paper Award in IEEE IGARSS 2018 on causal inference with kernels
2017 Elevation to "IEEE Distinguished Lecturer" (GRSS chapter)
2017 Google classic paper in Engineering and computer science / Remote sensing
2015 Winner of the "2015 IEEE GRSS Data Fusion Contest"
2015 ERC Consolidator Grant (ERC-CoG) 2015

2014 Best Paper Award in IEEE Whispers 2014.
2015 Winner of the "2015 IEEE GRSS Data Fusion Contest"
2013 Best Paper Award of IEEE Geoscience and Remote Sensing Society 2013 and "Editor's Choice OpenAccess paper"
2012 Best Paper Award in the IEEE IGARSS 2012 Student Prize Paper competition (Munich, Germany).
2011 Best paper of the IEEE Geoscience and Remote Sensing Society 2011
2011 Thomson Reuters Highly Cited Researcher
2011 Thomson Reuters ScienceWatch: Fast Moving Front research
2011 Thomson Reuters Essential Science Indicators: most-cited paper in Engineering in 2011
2009 2nd Best Paper Student Competition of the Joint Urban Remote Sensing Event 2009 (Shangai, China)
2009 3rd Best Paper Student Competition of the IEEE IGARSS09 (Capetown, South Africa)
2009 Best paper award in IEEE MLSP (Grenoble, France)

Media coverage (scientific)

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.

Media coverage (press releases, in spanish)

ABC	Algoritmos para predecir las hambrunas en África
Valencia Plaza	Crean un método para medir las constantes de la Tierra y determinar si son causas naturales o antropogénicas
Sinc Agency	Los bosques europeos son cada vez más vulnerables a los vientos, incendios y plagas de insectos
EFE	Hacen mapas de la vegetación, agua o clima con Inteligencia Artificial y Big Data
Prensa Ibérica	Cuatro científicos y una científica de la Universitat de València, en la élite mundial
Earth news	Física e Inteligencia Artificial para avanzar en la comprensión de los fenómenos climáticos y la Tierra
OK diario	Europa impulsará la inteligencia artificial contra el cambio climático con el foco en el Mediterráneo
Prensa Ibérica	El ISP reúnen expertos en fenómenos meteorológicos extremos y en la aplicación de algoritmos en València.
ELLIS.eu	AI for understanding extreme events
Fund Cañada	IA para Sostenibilidad
Valencia Plaza	El prof. Camps-Valls es un nuevo miembro de la Academia Europea de las Ciencias, y de la Academia Europaea.
Prensa Ibérica	Highly Cited Researcher 2022

10 most cited papers – 5 with 1500+ citations

1. *"Deep learning and process understanding for data-driven Earth System Science".* Reichstein, M. and Camps-Valls, G. and Stevens, B. and Denzler, J. and Carvalhais, N. and Jung, M. and Prabhat. Nature 566 :195-204, 2019. *JIF=41.6, >4000 citations*.
2. *"Hyperspectral remote sensing data analysis and future challenges."* JM Bioucas-Dias, A Plaza, *G Camps-Valls*, et al. *IEEE Geoscience and Remote Sensing Magazine 1 (2), 6-36*. *>1857 citations*.
3. *"Recent advances in techniques for hyperspectral image processing."* A. Plaza, J. A. Benediktsson, J. W. Boardman, J. Brazile, L. Bruzzone, *G. Camps-Valls*, J. Chanussot, M. Fauvel, P. Gamba, A. Gualtieri, M. Marconcini, J. C. Tilton, G. Trianni. *Rem. Sens. Environ.*, 113, S110-S122, 2009. *>1781 cites*.
4. *"Kernel-based methods for hyperspectral image classification." G. Camps-Valls* and L. Bruzzone. *IEEE Trans. Geosc. Rem. Sens.*, 43 (6), 1351-1362, 2005. *>1651 cites*. Identified by Thomson Reuters ScienceWatch as a Fast Moving Front research.
5. *"Composite kernels for hyperspectral image classification." G. Camps-Valls*, L. Gomez-Chova, J. Muñoz-Marí, J. Vila-Francés, J. Calpe-Maravilla. *IEEE Geosc. Rem. Sens. Lett.*, 3(1), 93-97. 2006. *>1200 citations*.
6. *"Semi-supervised graph-based hyperspectral image classification." G. Camps-Valls*, T. Bandos Marsheva, D. Zhou. *IEEE Trans. Geosc. Rem. Sens.*, 45 (10), 3044-3054, 2007. *JIF=3.16, >600 citations*.
7. *"Unsupervised deep feature extraction for remote sensing image classification"*. A Romero, C Gatta, G Camps-Valls. IEEE Transactions on Geoscience and Remote Sensing 54 (3), 1349-1362. *JIF=5.22, >500 citations*.
8. *"Advances in hyperspectral image classification: Earth monitoring with statistical learning methods"*. G Camps-Valls, D Tuia, L Bruzzone, JA Benediktsson. IEEE signal processing magazine 31 (1), 45-54 *JIF=11.35, >500 citations*.
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1. *"Discovering causal relations and equations from data"*. Gustau Camps-Valls and Andreas Gerhardus and Urmi Ninad and Gherardo Varando and Georg Martius and Emili Balaguer-Ballester and Ricardo Vinuesa and Emiliano Diaz and Laure Zanna and Jakob Runge Physics Reports, 1044, 1-68, 2023. *JIF=30*.
2. *"Exploring interactions between societal context and natural hazards on human population displacement".* Ronco, M. and Tárraga, J. M. and Muñoz, J. and Piles, M. and Sevillano Marco, E. and Wang, Q. and Miranda Espinosa, M. T. and Ponserre, S. and Camps-Valls, G. Nature Communications, 2023. *JIF=14*.
3. *"Causal inference for time series"*. Runge, Jakob and Gerhardus, Andreas and Varando, Gherardo and Eyring, Veronika and Camps-Valls, Gustau Nature Reviews Earth & Environment, 10, 2553, 2023. *JIF=37*.
4. *"A Unified Vegetation Index for Quantifying the Terrestrial Biosphere"*. G. Camps-Valls, M Campos-Taberner, A Moreno-Martínez, S Walther, G Duveiller, A Cescatti, M Mahecha, J Muñoz-Marí, F.J García-Haro, Luis Guanter, John Gamon, Martin Jung, Markus Reichstein, Steven W. Running. Science Advances, 2021.*JIF=14*.
5. *"Emergent vulnerability to climate-driven disturbances in European forests"*. Forzieri, G. and Girardello, M. and Ceccherini, G. and Spinoni, J. and Feyen, L. and Hartmann, H. and Beck, P.S.A and Camps-Valls, G. and Chirici, G. and Mauri, A. and Cescatti, A. Nature Communications, 2021.
6. *"Persistence in Complex Sytems"*. Sancho Salcedo-Sanz, ... and Gustau Camps-Valls Physics Reports, 2021. *JIF=22*.
7. *"Deep learning and process understanding for data-driven Earth System Science".* Reichstein, M. and Camps-Valls, G. and Stevens, B. and Denzler, J. and Carvalhais, N. and Jung, M. and Prabhat. Nature 566:195-204, 2019.*JIF=40*.
8. *"Compensatory water effects link yearly global land CO2 sink changes to temperature".* Jung, M. and Reichstein, M. and Schwalm, C. R. and Huntingford, C. and Sitch, S. and Ahlström, A. and Arneth, A. and Camps-Valls, G. and Ciais, P. and Friedlingstein, P. et al. Nature 541 (7638):516-520, 2017. *JIF=40*.
9. *"Inferring causation from time series with perspectives in Earth system sciences".* Runge, J. and Bathiany, S. and Bollt, E. and Camps-Valls, ... and Zscheischler, J. Nature Communications (2553):1-13, 2019. *JIF=14*.
10. *"Global and time-resolved monitoring of crop photosynthesis with chlorophyll fluorescence".* L. Guanter, Y. Zhang, M. Jung, J. Joiner, M. Voigt, J. A. Berry, C. Frankenberg, A. Huete, P. Zarco-Tejada, J-E. Lee, M. S. Moran, G. Ponce-Campos, C. Beer, *G. Camps-Valls*, N. Buchmann, D. Gianelle, K. Klumpp, A. Cescatti, J. M. Baker, and T. J. Griffis. Proceedings of the National Academy of Sciences, PNAS, 2014.*JIF=14*.

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.

- 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
- Dino Sejdinovic, Uni Oxford, UK
- Robert Jenssen, Uni Tromsø
- Bernhard Scholkopf, MPI Tübingen
- Jonas Peters, ETHZ

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

Research group structure and activity

- I coordinate a big research lab of 50+ researchers: the Image and Signal Processing (ISP) in the Universitat de València.
- The ISP group is a very active group in terms of publications (100+ journal papers in high impact factor journals in 5 years), projects (raised 10M€ in the last 5 years), outreach (100+ conferences & workshops and participation in fairs in the last 5 years) and developments (10+ software packages in the last 3 years), and educational activities (specialized courses on ML/AI, information theory and image processing, but also to basic Earth/Climate science to underrepresented communities and children).
- The team is young (average of 47 years old), scientifically very productive (average of 28 journal papers, 27 conference proceedings and 3 book chapters in the period $2016 - 2020$) and impactful ($h_{avg} = 33$).
- See full track record in the ISP web page, the ISP ResearchGate and ISP Google Scholar sites.

Journal papers

[1] Gustau Camps-Valls, Miguel-Ángel Fernández-Torres, Kai-Hendrik Cohrs, Adrian Höhl, Andrea Castelletti, Aytac Pacal, Claire Robin, Francesco Martinuzzi, Ioannis Papoutsis, Ioannis Prapas, Jorge Pérez-Aracil, Katja Weigel, Maria Gonzalez-Calabuig, Markus Reichstein, Martin Rabel, Matteo Giuliani, Miguel Mahecha, Oana-Iuliana Popescu, Oscar J. Pellicer-Valero, Said Ouala, Sancho Salcedo-Sanz, Sebastian Sippel, Spyros Kondylatos, Tamara Happé, and Tristan Williams. "Artificial Intelligence for Modeling and Understanding Extreme Weather and Climate Events". In: *Nature Communications* 16.1919 (2025), pp. 1–10. DOI: https://doi.org/10.1038/s41467-025-56573-8.

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Invited talks

[1] Jessenia Gonzalez, Sudhakar Dipu, Odran Sourdeval, Alexandre Siméon, Gustau Camps-Valls, and Johannes Quaas. *Emulation of Forward Modeled Top-of-Atmosphere MODIS-Based Spectral Channels Using Machine Learning*. 2025. DOI: 10.1109/JSTARS.2024.3507692.

[2] Gustau Camps-Valls. *Hybrid and Causal ML in the Earth sciences*. Online, Jan. 2024.

[3] Gustau Camps-Valls, Elodie Martinez, Ronan Fablet, and Cédric Jamet. *AI and remote sensing in ocean sciences*. 2024. DOI: https://doi.org/10.3389/fmars.2023.1248591.

[4] Gustau Camps-Valls. *A collective AI agenda for Earth Observation*. Barcelona, Feb. 2023.

[5] Gustau Camps-Valls. *AI for Sustainable Earth Sciences*. Alacant, 2023.

[6] Gustau Camps-Valls. *AI for the Earth sciences*. Vienna, Austria, 2023.

[7] Gustau Camps-Valls. *Advancing AI for Urban Sustainability*. Heraklion Crete, Greece, May 2023.

[8] Gustau Camps-Valls. *Causal Inference for Disaster Management*. Frascati, Italy, May 2023.

[9] Gustau Camps-Valls. *Graphs in State-Space Models for Granger Causality in Climate Science*. Paris, Apr. 2023.

[10] Gustau Camps-Valls. *Hybrid and Causal ML in the Earth sciences*. London, UK, Nov. 2023.

[11] Gustau Camps-Valls. *Living in the ML-Physics Interplay for the Earth sciences*. Cambridge, UK, Nov. 2023.

[12] Gustau Camps-Valls. *Machine learning for modeling and understanding the Earth system*. Ljubljana, Slovenia, 2023.

[13] Gustau Camps-Valls. *The role of AI in Digital Twins*. Leiden, NL, Feb. 2023.

[14] Gustau Camps-Valls. *A collective agenda for AI on the Earth sciences*. Online talk - ITU-UN AI4Good seminar series, Feb. 2022.

[15] Gustau Camps-Valls. *Advancing AI for modeling and understanding the Earth system*. E4C - Institut Polytechnique de Paris, May 2022.

[16] Gustau Camps-Valls. *Advancing AI for modeling and understanding the Earth system*. Stockholm, Sweden, Sept. 2022.

[17] Gustau Camps-Valls. *Physics-aware Machine Learning for Earth Observation*. New Orleans, Dec. 2022.

[18] Gustau Camps-Valls. *Advances in Machine Learning for Modelling and Understanding in Earth Sciences*. Online talk, Sept. 2021.

[19] Gustau Camps-Valls. *Advances in Machine Learning for Modelling and Understanding in Earth Sciences*. Online talk, Italy, Jan. 2021.

[20] Gustau Camps-Valls. *Gaussianizing the Earth*. Online talk, Nov. 2021.

[21] Gustau Camps-Valls. *Interpretability and Causality in Earth Sciences (aka "fitting is not enough")*. Online talk, Sept. 2021.

[22] Gustau Camps-Valls. *Living in the Physics and Machine Learning Interplay for the Earth Sciences*. Online talk, Zurich, May 2021.

[23] Gustau Camps-Valls. *Machine Learning for Earth and Climate Sciences*. Online talk, Oct. 2021.

[24] Gustau Camps-Valls. *Physics Aware Machine Learning for the Earth Sciences*. Online talk, Lisboa, May 2021.

[25] Gustau Camps-Valls. *Physics-aware Interpretable Machine learning in the Earth sciences*. Online talk, France, May 2021.

[26] Gustau Camps-Valls. *Physics-aware Machine Learning for the Earth sciences*. Online talk, https://www.climatechange.ai/, Sept. 2021.

[27] Gustau Camps-Valls. *Physics-aware machine learning and causality for the Earth sciences*. Online talk, Nov. 2021.

[28] Ioannis Papoutsis, Alkyoni Baglatzi, Souzana Touloumtzi, Markus Reichstein, Nuno Carvalhais, Fabian Gans, Gustau Camps-Valls, Maria Piles, Theofilos Kakantousis, Jim Dowling, Manolis Koubarakis, Dimitris Bilidas, Despina-Athanasia Pantazi, George Stamoulis, Christophe Demange, Leo-Gad Journel, Marco Bianchi, Chiara Gervasi, Alessio Rucci, Ioannis Tsampoulatidis, Eleni Kamateri, Tarek Habib, Alejandro Díaz Bolívar, Zisoula Ntasiou, and Anastasios Paschalis. *DeepCube: Explainable AI Pipelines for Big Copernicus data*. Online Everywhere, https://www.bigdatafromspace2021.org/, May 2021.

[29] G. Camps-Valls, M. Reichstein, Z. Zhu, and D. Tuia. *Advancing Deep Learning For Earth Sciences: From Hybrid Modeling To Interpretability*. Waikoloa, Hawaii, USA, July 2020.

[30] G. Camps-Valls, M. Reichstein, Z. Zhu, and D. Tuia. *Advancing Deep Learning For Earth Sciences: From Hybrid Modeling To Interpretability*. Waikoloa, Hawaii, USA, July 2020.

[31] G. Camps-Valls, D. H. Svendsen, J. Cortes-Andres, A. Moreno-Martínez, A. Pérez-Suay, J. Adsuara, I. Martin, M. Piles, J. Muñoz Marí, and L. Martino. *Living in the Physics – Machine Learning Interplay for Earth Observation*. June 2020.

[32] G. Camps-Valls, D. H. Svendsen, J. Cortes-Andres, A. Moreno-Martínez, A. Pérez-Suay, J. Adsuara, I. Martin, M. Piles, J. Muñoz Marí, and L. Martino. *Living in the Physics – Machine Learning Interplay for Earth Observation*. 2020.

[33] Gustau Camps-Valls. *Advances in Machine Learning for Earth Observation*. Dept Geography – University of Zurich, Switzerland, Apr. 2020.

[34] Gustau Camps-Valls. *Advances in Machine Learning for Earth Sciences*. Online Everywhere, https://www.conferencemanager.dk/sustainableai/conference/, Dec. 2020.

[35] Gustau Camps-Valls. *Advances in Machine Learning for Earth Sciences*. UGent Data Science Seminar – University of Ghent, Belgium, Feb. 2020.

[36] Gustau Camps-Valls. *Advances in Machine learning for Modelling and Understanding in Earth Sciences*. Severo Ochoa Research Seminars – Barcelona Supercomputing Center (BSC), Barcelona, Jan. 2020.

[37] Gustau Camps-Valls. *How to Surf the Physics and Machine Learning Interplay*. Online Everywhere, https://www.mlse2020.com/earth, Dec. 2020.

[38] Gustau Camps-Valls. *Living in the Physics-Machine learning interplay for earth observation*. Online Everywhere, https://www.ingarss2020.org/, Dec. 2020.

[39] Gustau Camps-Valls. *Living in the Physics and Machine Learning Interplay - An AI agenda with examples for the DTE*. ESA-ESRIN, Italy, Sept. 2020.

[40] Gustau Camps-Valls. *Living in the Physics and Machine Learning Interplay - An AI agenda with examples for the DTE*. ESA-ESRIN, Italy, Sept. 2020.

[41] Gustau Camps-Valls. *Advances in Machine Learning for Earth Observation*. CEPT, Ahmedabad, India, June 2019.

[42] Gustau Camps-Valls. *Advances in Machine Learning for Earth Observation*. ESA BIDs 2019, Feb. 2019.

[43] Gustau Camps-Valls. *Learning nonlinear feature representations from Earth data*. EGU 2019, Apr. 2019.

[44] Gustau Camps-Valls. *Machine Learning for Earth Observation*. Cavanilles Institute of Biodiversity and Evolutionary Biology, Valencia, Mar. 2019.

[45] Gustau Camps-Valls. *Multivariate Gaussianization: Information Bottleneck and Flows*. Technical University of Berlin, Germany, Oct. 2019.

[46] Gustau Camps-Valls. *New Machine Learning for Earth and Climate Sciences*. ISI, Mumbai, India, June 2019.

[47] Gustau Camps-Valls. *Physics-aware Machine Learning and Causal Inferece in Earth and Climate Sciences*. ISI, Bangalore, India, July 2019.

[48] Gustau Camps-Valls. *Physics-aware Machine Learning for Earth Observation*. Wageningen University and Research, Wageningen, The Netherlands, Sept. 2019.

[49] Gustau Camps-Valls. *Revisiting global teleconnections of ENSO over soils and vegetation*. ESA Living Planet Symposium, 2019, May 2019.

[50] Gustau Camps-Valls. *Towards Physics-aware Machine Learning for Earth Observation*. Indian Statistical Institute, Kalkota, India, July 2019.

[51] Gustau Camps-Valls. *From sparsity to Gaussianization in neural networks*. Department of Engineering Mathematics, University of Bristol, UK, Oct. 2018.

[52] Gustau Camps-Valls. *Gaussianization, Independence, Fairness*. Oxford, Dep. Statistics, July 2018.

[53] Gustau Camps-Valls. *HyperLabelMe: Benchmarking Image Classifiers*. The Phi-week - EO Open Science and Future EO - ESA-ESRIN, Italy, Nov. 2018.

[54] Gustau Camps-Valls. *Machine Learning for Climate: 15 ways to leave your lover*. Machine Learning and Climate Workshop 2018 - Oxford, UK, Oct. 2018.

[55] Gustau Camps-Valls. *Machine learning for Earth Observation*. Climathon KIC. Universitat de València, Oct. 2018.

[56] Gustau Camps-Valls. *Neural networks, Gaussianization, and information distillation*. Digital Globe, Denver, US, Sept. 2018.

[57] Gustau Camps-Valls. *Physics-aware And Explainable Machine Learning*. The Phi-week - EO Open Science and Future EO - ESA-ESRIN, Italy, Nov. 2018.

[58] Gustau Camps-Valls. *Physics-driven Gaussian Processes for Earth Observation*. Imperial College London, UK, Oct. 2018.

[59] Gustau Camps-Valls. *Unsupervised Deep Feature Learning with Sparse Codes and Gaussianization*. NCAR, Boulder, US, Sept. 2018.

[60] Gustau Camps-Valls. *Unsupervised Deep Networks: Neural networks, Gaussianization, and information distillation*. Colorado State University, Fort Collins, US, Sept. 2018.

[61] Gustau Camps-Valls. *Unsupervised Deep Networks: Sparsity, Gaussianization, and the information bottleneck*. Descartes Labs, Santa Fe, US, Sept. 2018.

[62] Gustau Camps-Valls, Juan Johnson, Valero Laparra, Diego Bueso, Gunnar Brandt, Norman Fomferra, Hans Permana, and Miguel Mahecha. *Statistical Distillation of the Earth System Data Cube*. The Phi-week - EO Open Science and Future EO - ESA-ESRIN, Italy, Nov. 2018.

[63] G. Camps-Valls. *Potential of Machine Learning for FLUXCOM upscaling*. MPI BGC - FLUXCOM workshop. Jena, Germany, May 2017, 2017.

[64] G. Camps-Valls. *Vegetation Monitoring with Gaussian Processes and Latent Force Models*. EGU17 - Vienna, Austria, 23-28 April 2017, 2017.

[65] G Camps-Valls, L Gómez-Chova, G Mateo, V Laparra, A Pérez-Suay, and J Muñoz Marí. *Large Scale Gaussian Processes for Atmospheric Parameter Retrieval and Cloud Screening*. New Orleans, USA, 11-15 December 2017, 2017.

[66] G Camps-Valls, J Verrelst, L Martino, and J Vicent. *Advanced Machine Learning Emulators of Radiative Transfer Models*. New Orleans, USA, 11-15 December 2017, 2017.

[67] Gustau Camps-Valls. *Advanced Machine Learning for Biophysical Parameter Retrieval*. IEEE Distinguished Lecturer - Rio de Janeiro, Brasil, Nov. 2017.

[68] Gustau Camps-Valls. *Machine Learning in Remote Sensing*. IEEE Distinguished Lecturer - Campinas, Brasil, Nov. 2017.

[69] Gustau Camps-Valls. *Open problems in remote sensing*. Causality in Complex Systems - Amsterdam Soesterberg, The Netherlands, June 2017.

[70] Gustau Camps-Valls. *Physics-Aware Gaussian Processes for Earth Observation*. SCIA17 - Tromsø, Norway, June 2017.

[71] Gustau Camps-Valls. *Physics-aware machine learning for biophysical parameter retrieval*. BACI meeting - Jena, Germany, June 2017.

[72] L. Martino, D. Luengo, and G. Camps-Valls. *Latent Force Models for Model-Data Integration in Vegetation Monitoring*. EARSeL17 - 19-21 April 2017, University of Zurich (Switzerland), 2017.

[73] A. Moreno-Martínez, G. Camps-Valls, N. Carvalhais, J. Kattge, N. Robinson, M. Reichstein, B. Allred, and S.W. Running. *Mapping wood density globally using remote sensing and climatological data*. New Orleans, USA, 11-15 December 2017, 2017.

[74] G. Camps-Valls. *Domain Adaptation with the Kernel Manifold Alignment*. Computer Science Dep. Universidad Autonoma de Madrid, Spain, 2016.

[75] G. Camps-Valls. *Machine learning for Remote Sensing*. TUM-DLR Summer School, Munich, Germany, 2016.

[76] G. Camps-Valls. *Monitoring Vegetation From Space with Gaussian Processes and Latent Force Models*. Seville, Spain, Dec. 2016.

[77] G. Camps-Valls. *Semisupervised manifold alignment with kernels*. Institute of Science and Technology Austria, 2016.

[78] G. Camps-Valls. *Kernel manifold alignment*. StatLearn conference, Grenoble, France, 2015.

[79] G. Camps-Valls. *Learning Structures in Earth Observation Data with Gaussian Processes*. ECML Time series Workshop, Porto, Portugal, 2015.

[80] G. Camps-Valls. *Monitoring Earth Climate Variables with Statistical Inference*. CVPR EarthVision Workshop, Boston, USA, 2015.

[81] G. Camps-Valls. *The role of modern machine learning in Earth observation*. MPI-Biogeochemistry, Jena, Germany, 2015.

[82] G. Camps-Valls. *Advances in Kernel Methods for Remote Sensing Image Processing*. Keynote speaker at the SIU conference, Trabzon, Turkey, 2014.

[83] G. Camps-Valls. *Hyperspectral image processing*. València, Spain, 2014.

[84] G. Camps-Valls. *Kernel methods for hyperspectral image processing*. Lausanne, Switzerland, 2014.

[85] G. Camps-Valls. *Advances in Kernel Image Processing*. Keynote speaker at the Conference on Image Processing and Pattern Recognition, NOBIM. Oslo, Norway, 2013.

[86] G. Camps-Valls. *Back to the 60s: Kernel Methods to Deep Neural Networks in Remote Sensing Data Processing*. IMA Hot Topics Workshop - Imaging in Geospatial Applications, University of Minnessota, USA, 2013.

[87] G. Camps-Valls. *Recent machine learning developments for remote sensing data processing*. MPI for Biogeochemistry, Jena, Germany, 2013.

[88] G. Camps-Valls. *Extended Kernel Methods*. Computing and Informatics Seminars, Univ. Bournemouth, UK, 2012.

[89] G. Camps-Valls. *Iterative Gaussianization Framework for Image Processing*. Computer Vision Center, Barcelona, 2012.

[90] G. Camps-Valls. *Kernel Signal-To-Noise Ratio for Machine Learning*. Computer Vision Center, Barcelona, 2012.

[91] G. Camps-Valls. *Multivariate Gaussianization for data processing*. Nice, France, 2012.

[92] G. Camps-Valls. *Statistical Learning in Earth Monitoring*. EPFL, Lausanne, Switzerland, 2012.

[93] G. Camps-Valls. *SVM for remote sensing image classification: tricks of the trade*. Keynote speaker at the SPIE Conf. on signal and image processing. Prague, Czech Rep., 2011.

[94] G. Camps-Valls. *Iterative Gaussianization Framework*. GIPSA lab: Grenoble Inst. Tech (France), 2009.

[95] G. Camps-Valls. *Natural Image Relations in Denoising*. MPI for Biological Cybernetics, Tübingen, Germany, 2009.

[96] G. Camps-Valls. *Natural Image Relations in Kernel-based Image Denoising*. Max Planck Institute for Biological Cybernetics, Tübingen, Germany, 2009.

[97] G. Camps-Valls. *Kernel Classifiers in Remote Sensing*. University of Lausanne, Switzerland, 2008, 2008.

[98] G. Camps-Valls. *Kernel-based Data Fusion*. ITN network: HYPER-I-NET School on Hyperspectral Imaging. Cáceres, Spain, 2007.

[99] G. Camps-Valls. *Kernel methods in Bioinformatics*. Stockholm Bioinformatics Center (SBC). Stockholm, Sweden, 2006.

[100] G. Camps-Valls. *Kernel Methods in Remote Sensing: Introduction, Applications and Research Opportunities*. Max Planck Institute (Tübingen, Germany), 2005.

Books

[1] Gustau Camps-Valls, Devis Tuia, Xiao Xiang Zhu, and Markus Reichstein. *Deep learning for the Earth Sciences: A comprehensive approach to remote sensing, climate science and geosciences*. Wiley & Sons, 2021. ISBN: 9781119646143.

[2] J.L. Rojo-Álvarez, M. Martínez-Ramón, J. Muñoz-Marí, and G. Camps-Valls. *Digital Signal Processing with Kernel Methods*. UK: Wiley & Sons, Apr. 2018. ISBN: 978-1118611791.

[3] Gustavo Camps-Valls, Devis Tuia, Luis Gómez-Chova, Sandra Jiménez, and Jess Malo. *Remote Sensing Image Processing*. 1st. Morgan & Claypool Publishers, 2011. ISBN: 1608458199, 9781608458196.

[4] G. Camps-Valls and L. Bruzzone. *Kernel methods for Remote Sensing Data Analysis*. Ed. by G. Camps-Valls and L. Bruzzone. UK: Wiley & Sons, Dec. 2009. ISBN: 978-0-470-72211-4.

[5] G. Camps-Valls, J. L. Rojo-Álvarez, and M. Martínez-Ramón. *Kernel Methods in Bioengineering, Signal and Image Processing*. Hershey, PA (USA): Idea Group Publishing, Nov. 2007. ISBN: 1-559904-042-5.

Book chapters

[6] Jose E Adsuara, Manuel Campos-Taberner, Javier García-Haro, Carlo Gatta, Adriana Romero, and Gustau Camps-Valls. "Learning Unsupervised Feature Representations of Remote Sensing Data with Sparse Convolutional Networks". In: Wiley Online Library, 2021, pp. 13–23.

[7] Gustau Camps-Valls. "Perspective on Deep Learning for Earth Sciences". In: *Generalization with Deep Learning: for Improvement on Sensing Capability*. Ed. by Zhenghua Chen, Xiaoli Li, and Min Wu. World Scientific Pub Co Inc, 2021, pp. 159–173. ISBN: 978-9811218835.

[8] M. Reichstein, B. Ahrens, B. Kraft, G. Camps-Valls, N. Carvalhais, F. Gans, P. Gentine, and A.J. Winkler. "Combining system modeling and machine learning into hybrid ecosystem modeling". In: *Science-guided Machine Learning: Emerging Trends in Combining Scientific Knowledge with Data-driven Methods*. Ed. by Anuj Karpatne, Ramakrishnan Kanan, and Vipin Kumar. Data Mining and Knowledge Discovery Series. CRC Press, 2021.

[9] Gustau Camps-Valls, Luis Gómez-Chova, Valero Laparra, Luca Martino, Gonzalo Mateo-García, Jordi Muñoz-Marí, Daniel H. Svendsen, and Jochem Verrelst. "Statistical biophysical parameter retrieval and emulation with Gaussian processes". In: *Hyperspectral Imaging*. Ed. by José Manuel Amigo. Vol. 32. Data Handling in Science and Technology. Elsevier, 2020, pp. 333–368. DOI: https://doi.org/10.1016/B978-0-444-63977-6.00015-8.

[10] Álvaro Moreno-Martínez, Maria Piles, Jordi Muñoz-Marí, Manuel Campos-Taberner, Jose E. Adsuara, Anna Mateo, Adrián Pérez-Suay, Francisco Javier García-Haro, and Gustau Camps-Valls. "Machine Learning Methods for Spatial and Temporal Parameter Estimation". In: *Hyperspectral Image Analysis - Advances in Machine Learning and Signal Processing: In Series 'Advances in Computer Vision and Pattern Recognition'*. Ed. by Saurabh Prasad and Jocelyn Chanussot. Springer-Verlag, 2020.

[11] Álvaro Moreno-Martínez, María Piles, Jordi Muñoz-Marí, Manuel Campos-Taberner, Jose E Adsuara, Anna Mateo, Adrián Pérez-Suay, Francisco Javier García-Haro, and Gustau Camps-Valls. "Machine Learning Methods for Spatial and Temporal Parameter Estimation". In: *Hyperspectral Image Analysis*. Springer, 2020, pp. 5–35.

[12] Jochem Verrelst, Zbynek Malenovsky, Christiaan Van der Tol, Gustau Camps-Valls, Jean-Philippe Gastellu-Etchegorry, Philip Lewis, Peter North, and Jose Moreno. "Quantitative land vegetation products of imaging spectroscopy: a review on retrieval methods". In: Springer-Verlag, 2018.

[13] E. Izquierdo, V. Laparra, J. Muñoz-Marí, L Gómez-Chova, and Gustau Camps-Valls. "Feature extraction in Earth Observation Data Processing". In: *Comprehensive Remote Sensing*. Elsevier, 2017.

[14] D. Tuia, M. Volpi, J. Verrelst, and G. Camps-Valls. "Advances in Kernel Machines for Image Classification and Biophysical Parameter Retrieval". In: *Mathematical Models for Remote Sensing Image Processing: Models and Methods for the Analysis of 2D Satellite and Aerial Images*. Vol. 1. 1. Springer Verlag, 2017, pp. 1–1.

[15] Pablo Ruiz, Javier Mateos, Gustavo Camps-Valls, Rafael Molina, and Aggelos K. Katsaggelos. "Interactive Pansharpening and Active Classification in Remote Sensing". In: *Multimodal Interaction in Image and Video Applications*. Vol. 48. Intelligent Systems Reference Library. Springer Berlin Heidelberg, 2013, pp. 67–81. ISBN: 978-3-642-35931-6. DOI: 10.1007/978-3-642-35932-3_5.

[16] Luis Gómez-Chova, Jordi Muñoz-Marí, Valero Laparra, Jesús Malo-López, and Gustavo Camps-Valls. "A Review of Kernel Methods in Remote Sensing Data Analysis". In: *Optical Remote Sensing – Advances in Signal Processing and Exploitation Techniques*. Ed. by Saurabh Prasad, Lori M. Bruce, and Jocelyn Chanussot. Vol. 3. Augmented Vision and Reality. Springer Berlin Heidelberg, 2011, pp. 171–206. ISBN: 978-3-642-14211-6. DOI: 10.1007/978-3-642-14212-3_10.

[17] J. L. Rojo-Álvarez, G. Camps-Valls, F. Caamaño-Fernández, and J. F. Guerrero-Martínez. "A Review of Kernel Methods in ECG Signal Classification". In: *ECG Signal Processing, Classification and Interpretation: A Comprehensive Framework of Computational Intelligence*. Ed. by A. Gacek and W. Pedrycz. Germany: Springer-Verlag, 2011, pp. 194–218.

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[21] L. Gómez-Chova, J. Calpe-Maravilla, L. Bruzzone, and G. Camps-Valls. "Kernel Mean for Semi-supervised Remote Sensing Image Classification". In: *Kernel methods for Remote Sensing Data Analysis*. Ed. by G. Camps-Valls and L. Bruzzone. UK: Wiley & Sons, 2009. ISBN: 978-0-470-72211-4.

[22] J. Muñoz-Marí, L. Gómez-Chova, J. Calpe-Maravilla, and G. Camps-Valls. "Multi-temporal Image Classification and Change Detection with Kernels". In: *Kernel methods for Remote Sensing Data Analysis*. Ed. by G. Camps-Valls and L. Bruzzone. UK: Wiley & Sons, 2009. ISBN: 978-0-470-72211-4.

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[24] S. Salcedo, G. Camps-Valls, and C. Bousoño-Calzón. "Hybrid Genetic Algorithms in Data Mining Applications". In: *Encyclopedia of Data Warehousing and Mining (2 Volumes), 2nd edition*. Ed. by John Wang. Hershey, PA (USA): Idea Group Inc., Jan. 2009. ISBN: 1-59140-557-2.

[25] F. Alonso-Atienza, A. Rosado-Muñoz, J. L. Rojo-Álvarez, and G. Camps-Valls. "Learning the Relevant Features of Ventricular Fibrillation from Automatic Detection Algorithms". In: *Intelligent Systems: Techniques and Applications*. Ed. by Evor Hines, Manel Martínez-Ramón, Matteo Pardo, Eduard Llobet, Mark Leeson, Daciana Iliescu, and Jianhua Yang eds. Maastrich, The Netherlands: Shaker Publishing, 2008, pp. 505–534. ISBN: 978-90-423-0345-4.

[26] G. Camps-Valls, J. Muñoz-Marí, L. Gómez-Chova, and J. Calpe-Maravilla. "Kernel Machines in Remote Sensing Image Classification". In: *Intelligent Systems: Techniques and Applications*. Ed. by Evor Hines, Manel Martínez-Ramón, Matteo Pardo, Eduard Llobet, Mark Leeson, Daciana Iliescu, and Jianhua Yang eds. Maastrich, The Netherlands: Shaker Publishing, 2008, pp. 199–222. ISBN: 978-90-423-0345-4.

[27] G. Camps-Valls and A. Rodrigo-González. "Classification of Satellite Images with Regularized AdaBoosting of RBF Neural Networks". In: *Speech, Audio, Image and Biomedical Signal Processing using Neural Networks*. Ed. by Bhanu Prasad and S. R. Mahadeva Prasanna. Germany: Springer-Verlag, 2008, pp. 307–326. ISBN: 978-3-540-75397-1.

[28] L. Bruzzone, L. Gómez-Chova, M. Marconcini, and G. Camps-Valls. "Hyperspectral Image Classification with Kernels". In: *Kernel Methods in Bioengineering, Signal and Image Processing*. Ed. by G. Camps-Valls, J. L. Rojo-Álvarez, and M. Martínez-Ramón. Hershey, PA (USA): Idea Group Inc., Nov. 2007. ISBN: 1-559904-042-5.

[29] J. Gutiérrez, G. Gómez-Pérez, J. Malo, and G. Camps-Valls. "Perceptual Image Representations for Support Vector Machine Image Coding". In: *Kernel Methods in Bioengineering, Signal and Image Processing*. Ed. by G. Camps-Valls, J. L. Rojo-Álvarez, and M. Martínez-Ramón. Hershey, PA (USA): Idea Group Inc., Nov. 2007. ISBN: 1-559904-042-5.

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[32] G. Camps-Valls, L. Gómez-Chova, J. Calpe-Maravilla, J. Muñoz-Marí, J. D. Martín-Guerrero, L. Alonso-Chordá, and J. Moreno. "Hyperspectral Kernel Classifiers". In: *Pattern Recognition: Progress, Directions and Applications*. Ed. by J. Vitrià F. Pla P. Radeva. Barcelona, Spain: Computer Vision Center, Universitat Autònoma de Barcelona, 2006, pp. 75–94. ISBN: 84-933652-6-2.

[33] G. Camps-Valls and J. D. Martín-Guerrero. "Neural and kernel methods for Therapeutic Drug Monitoring". In: *Neural Networks in Healthcare: Potential and Challenges*. Ed. by J. Kamruzzaman, R. K. Begg, and R. A. Sarker. Hershey, PA, USA: Idea Group Inc., 2006, pp. 231–268. ISBN: 1-59140-848-2.

Teaching activities

1998-1999 **CAD Techniques, 88h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

1999-2000 **Microelectronics, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

1999-2000 **Signal processing, 48h**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2000-2001 **Electronic Instrumentation Lab, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2001-2002 **Analog Devices, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2002-2003 **Digital Signal Processing, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2002-2003 **Filters, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2003-2011 **Advanced Signal Processing, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2005-2009 **Time series analysis, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2006-2012 **Analog Electronics I, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2007-2009 **Kernel classifiers in remote sensing, 28h/yr**, *Université de Lausanne*, Switzerland, Master Env. Sciences.
[Coordinator: material preparation, teaching, evaluation]

2008-2015 **Analog Electronics I, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2010-2018 **Circuits and systems, 60h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2010-2018 **Image Processing, 48h/yr**, *Universitat de València*, Spain, Master Earth Sciences.
[Coordinator: material preparation, teaching, exercises, evaluation]

2012-2018 **Machine learning for remote sensing, 60h/yr**, *Universitat de València*, Spain, Master Earth Sciences.
[Coordinator: material preparation, teaching, exercises, evaluation]

2010-2017 **Circuits and systems, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2010-2014 **Kernel methods for computer vision, 28h/yr**, *Universitat Autònoma de Barcelona*, Spain, Master Computer Vision.
[Coordinator: material preparation, teaching, evaluation]

2010-2017 **Circuits and systems, 48h/yr**, *Universitat de València*, Spain, Bachelor Elec.Eng..
[Coordinator: material preparation, teaching, exercises, evaluation]

2012-2019 **Data analysis, 24h/yr**, *Universitat de València*, Spain, Master Earth Sciences.
[Coordinator: material preparation, teaching, exercises, evaluation]

2015-2019 **Information theory, 12h/yr**, *Universitat de València*, Spain, Master Comp. Sci..
[Coordinator: material preparation, teaching, exercises, evaluation]

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	SPIE conference on Remote Sensing 2011, NOBIM Norwegian conf on machine learning and pattern recognition 2013, SIU-2014 Turkey, CVPR-2015 (workshop on remote sensing), StatLearn'15, ECML'15 (workshop on time series analysis)
General Chair	IEEE MLSP 2012. Santander, Spain
Technical Chair	IEEE IGARSS 2018, València, Spain
IEEE GRSS Distinguished Lecturer	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 19 PhDs. List of their theses are given below. 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.

PhD Theses

[1] Emiliano Diaz. "Advances in causal inference for geoscience and remote sensing". Gustau Camps-Valls and Valero Laparra (advisors). PhD thesis. Universitat de València, Spain: Universitat de València, Spain, 2024.

[2] Anna Mateo. "Advances in machine learning for remote sensing crop yield predction". Maria Piles, Jordi Muñoz-Marí, Gustau Camps-Valls (advisors). PhD thesis. Universitat de València, Spain: Universitat de València, Spain, 2023.

[3] Emmanuel J. Johnson. "Estimating Information in Earth System Data with Machine Learning". Gustau Camps-Valls and Valero Laparra (advisors). PhD thesis. Universitat de València, Spain: PhD Universitat de València, Spain, 2021.

[4] Guido Kraemer. "Changes in the coupled Biosphere-Human System". Miguel Mahecha, Markus Reichstein, Gustau Camps-Valls (advisors). PhD thesis. Universitat de València, Spain: PhD Universitat de València, Spain, 2020.

[5] Daniel Svendsen. "Integrating Physics Modelling with Machine Learning for Remote Sensing". Gustau Camps-Valls and Luca Martino (advisors). PhD thesis. Universitat de València, Spain: PhD Universitat de València, Spain, 2020.

[6] Manuel Campos-Taberner. "Development of an earth observation processing chain for crop biophysical parameters at local and global scale". F.J- García-Haro and G. Camps-Valls (advisors). PhD thesis. Universitat de València, Spain: PhD in Remote Sensing, Universitat de València, Spain, 2017.

[7] Valero Laparra. "Learning efficient image representations: Conections between statistics and neuroscience". J. Malo and G. Camps-Valls (advisors). PhD thesis. Universitat de València, Spain: Universitat de València, Spain, 2013.

[8] Emma Izquierdo Verdiguier. "Detección automática de plantaciones de árboles de cultivo en imágenes de muy alta resolución". L. Gómez Chova and G. Camps-Valls (advisors). PhD thesis. Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2011.

[9] Luca Capobianco. "Advances in Hyperspectral Kernel screening algorithm Target Detection". A. Garzelli and G. Camps-Valls (advisors). PhD thesis. Universita degli Studi di Siena, Italy: Universita degli Studi di Siena, Italy, 2009.

[10] Juan Gómez Sanchis. "Desarrollo de técnicas avanzadas para la detección de defectos superficiales peligrosos en cítricos basadas en imágenes hiperespectrales". J. Blasco Ivars and G. Camps-Valls (advisors). PhD thesis. Universitat de València, Spain: Universitat de València, Spain, 2009.

[11] Luis Gómez Chova. "Cloud screening algorithm for MERIS and CHRIS satellite sensors". G. Camps-Valls and J. Calpe (advisors). PhD thesis. Universitat de València, Spain: Universitat de València, Spain, 2008.

Ongoing PhD Theses

[1] Franziska Müller. "Deep learning to explain disturbances". A. Bastos and G. Camps-Valls (advisors). TBD 2026.

[2] Deborah Bassotto. "Causal characterization of extreme events". E. Diaz and G. Camps-Valls (advisors). TBD 2025.

[3] Jordi Cerdà. "Causal effect estimation to study food insecurity". Vassilis Sitokonstantinou and G. Camps-Valls (advisors). TBD 2025.

[4] Homer Durand. "Learning causal representations of the Earth system". G. Varando and G. Camps-Valls (advisors). TBD 2025.

[5] Mohit Anand. "Understanding drivers of forest mortailty with deep learning and XAI". J Zscheischler and G. Camps-Valls (advisors). TBD 2024.

[6] Kai-Hendrik Cohrs. "Characterization of hybrid machine learning". G. Camps-Valls and M. Reichstein (advisors). TBD 2024.

[7] Jordi Cortes. "Machine learning for detection and attribution of climate extremes". M. A. Fernandez-Torres and G. Camps-Valls (advisors). TBD 2024.

[8] Maria Gonzalez. "Anomaly and extreme event detection with attention networks". M. A. Fernandez-Torres and G. Camps-Valls (advisors). TBD 2024.

[9] Spyros Kondylatos. "Bayesian Neural Networks in EO". I. Papotsis and G. Camps-Valls (advisors). TBD 2024.

[10] Laura Martinez. "High resolution Products for better quantifying the terrestrial biosphere". A. Moreno and G. Camps-Valls (advisors). TBD 2024.

[11] Paolo Pelucchi. "Physics-aware and explainable ML for dust and cloud properties retrieval". G. Camps-Valls and Philip Stier (advisors). TBD 2024.

[12] Ioannis Prapas. "Deep Learning for Fire Danger Forecasting using Earth Observation Data". I. Papotsis and G. Camps-Valls (advisors). TBD 2024.

[13] Cristina Radin. "Machine learning for sea level variability forecasting and impact assessment". V. Nieves and G. Camps-Valls (advisors). TBD 2024.

[14] Jose Maria Tarraga. "Causal inference in the human-biosphere coupled system". M. Piles and G. Camps-Valls (advisors). TBD 2024.

[15] Jessenia Gonzalez Villarreal. "Detection of aerosol-cloud interactions in observations space". Johannes Quaas and G. Camps-Valls (advisors). TBD 2024.

[16] Tristan Williams. "Attribution of extreme impacts in European ecosystems with machine learning". G. Camps-Valls and M. Mahecha (advisors). TBD 2024.

[17] Mengxue Zhang. "Physics-Aware Deep Learning Models for Drought Monitor and Prediction Based on Multi-Source Observational Data". G. Camps-Valls and (advisors). TBD 2024.

[18] N. V. Jiménez, E. Soria, A. Albert, A. J. Serrano, and G. Camps. "Prediction of digoxin Plasma Potentially Toxic Levels by Using a Neural Network Model". Oct. 1999.

Master Theses

[1] Juan Palao Barceló. *Detección de perturbaciones en la cubierta terrestre vegetal mediante análisis y segmentación espectro-temporal*. Álvaro Moreno Martínez; Gustau Camps-Valls;(advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2020.

[2] Fernando L. Rodríguez Brizuela. *Estimación de parámetros biofísicos de cultivos de arroz mediante procesos gaussianos utilizando imágenes de radar de apertura sintética*. Juan Manuel López Sánchez; Gustau Camps-Valls (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2020.

[3] Miguel Morata Dolz. *Evaluación del impacto del clima sobre la vegetación mediante causalidad de Granger no lineal*. Gustau Camps-Valls;(advisor). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2020.

[4] Cristina Radin. *Decadal,regional sea level assessment using advanced statistical techniques*. Verónica Nieves; Gustau Camps-Valls;(advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2020.

[5] José María Tárraga. *Estudio del impacto del clima en las migraciones humanas mediante aprendizaje estadístico*. Gustau Camps-Valls; Maria Piles (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2020.

[6] Laura Martínez Ferrer. *Estimación de la producción de cultivos a través de la fusión de MODIS y SMAP mediante algoritmos de regresión*. G. Camps-Valls and M. Piles (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2019.

[7] Laura Almendra Martin. *Análisis del impacto de ENSO y NAO en variables climáticas esenciales y en la ocurrencia de eventos extremos*. G. Camps-Valls and M. Piles (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2018.

[8] Diego Bueso Acevedo. *Estudio del impacto de El Niño Godzilla en la humedad del suelo global*. G. Camps-Valls and M. Piles (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2017.

[9] Rafael Llorens Company. *Relación entre la humedad del suelo y el riesgo de incendios en el continente europeo*. G. Camps-Valls and M. Piles (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2017.

[10] Sergio Montes Fernández. *Identificación mineral mediante sensores multiespectrales e hiperespectrales*. G. Camps-Valls (advisor). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2017.

[11] Adrià Descals Ferrando. *Parameter estimation by hyperspectral and LiDAR data fusion*. G. Camps-Valls (advisor). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2016.

[12] Judit Borràs Hernandis. *Clasificación de suelos a partir de imágenes Sentinel-2*. J. Delegido and G. Camps-Valls (advisor). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2016.

[13] J. R. Chire Chira. *Detección de cambios multi-sensor ante un evento sísmico*. G. Camps-Valls (advisor). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2014.

[14] Emma Izquierdo Verdiguier. *Kernel feature extraction methods for remote sensing data analysis*. L. Gómez-Chova and G. Camps-Valls (advisors). Universitat de València, Spain, 2014.

[15] Manuel Campos-Taberner. *Evaluación de Procesos Gaussianos en la estimación de parámetros biofísicos*. G. Camps-Valls (advisor). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2013.

[16] Saúl Ramos Peredo. *Spectral Unmixing Techniques for Mineral Mapping with Hyperspectral Imagery*. G. Camps-Valls (advisor). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2013.

[17] Alfonso Moya Fuero. *Detección automática de nuevas construcciones a partir de ortofotos del Instituto Cartográfico Valenciano*. J. García-Haro and G. Camps-Valls (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2012.

[18] Antonio Rodrigo González. *Estimación de parámetros atmosféricos mediante métodos núcleo*. G. Camps-Valls (advisor). Universitat de València, Spain: Master in Electrical Engineering, Universitat de València, Spain, 2011.

[19] Joan Vicent Talens Noguera. *Nova mètrica de similitud per a l'avaluació de productes de multiresolució d'imatges*. J. Moreno and G. Camps-Valls (advisors). Universitat de València, Spain: Master in Remote Sensing, Universitat de València, Spain, 2011.

[20] Antonio Rodrigo González. *Clasificación supervisada de imágenes hiperespectrales mediante máquinas de vectores soporte y AdaBoosting*. G. Camps-Valls (advisor). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2006.

[21] Gustavo Bolaños Merario. *Interfaz de MATLAB para la extracción de características y clasificación de imágenes*. G. Camps-Valls (advisor). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2006.

[22] Valero Laparra Pérez-Muelas. *Compresión de imágenes mediante SVM adaptativa perceptual en el dominio wavelet*. J. Malo and G. Camps-Valls (advisors). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2006.

[23] Valero Laparra Pérez-Muelas. *Eliminación de ruido en imágenes mediante kernels basados en información mútua en el dominio wavelet*. J. Malo and G. Camps-Valls (advisors). Universitat de València, Spain: Computer Science Dep and Electrical Engineering Dep., Universitat de València, Spain, 2006.

[24] Juan Gómez Sanchis. *Desarrollo de técnicas de análisis de imágenes hiperespectrales. Aplicación a un sistema de identificación de podredumbres en cítricos basado en filtros sintonizables de cristal líquido*. G. Camps-Valls (advisor). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2006.

[25] David Campayo Villalta. *Análisis de splines autorregresivos multivariantes en teledetección*. G. Camps-Valls (advisor). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2006.

[26] Tatyana V. Bandos. *Effective early stopping in support vector machines procedures using statistical criteria*. E. Soria and G. Camps-Valls (advisors). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2004.

[27] Jaime Girbés Candel. *Igualación robusta de canales de comunicaciones mediante filtros gamma y Laguerre*. G. Camps-Valls (advisor). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2003.

[28] Gabriel Gómez Pérez. *Compresión de imágenes mediante SVM adaptativa perceptual*. J. Malo and G. Camps-Valls (advisors). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2003.

[29] Sergio Sáez. *Desarrollo de modelos neuronales FIR en problemas de predicción en farmacocinética clínica*. G. Camps-Valls (advisor). Universitat de València, Spain: Electrical Engineering Dep., Universitat de València, Spain, 2001.

Promotion and screening of past alumni

All investigators trained in our team are now working in the scientific-technical, or in R&D companies, technological public institutes, or in the academia:

- Y. Navarro works at the Center for Research and Development of the Navy,
- G. Gómez works at Analog Devices Inc,
- J. Gómez has worked in the Valencian Institute for Agricultural Technology (IVIA), and is currently an assistant professor in the Electronics Engineering Dep. at the University of Valencia.
- T. Bandos is Assistant Professor at the Univ. Basque Country,
- I. Epifanio is Associate Professor at the UJI
- J. Gutiérrez and L. Gómez are Associate Professors at the Univ. Valencia.
- Vicent Talens moved to the Hull University to work on saliency estimation,
- Dr. E. Izquierdo is now an Assistant professor at BOKU, Vienna, Austria
- Raúl Santos got an Assistant Professorship in Bristol University (UK)
- V. Laparra was a postdoc in the New York University, USA, and now returned to ISP-UV and became an assistant professor at the Dep. Electrical Engineering.
- E. Johnson is now a postdoc in a top-notch center for oceanography in Grenoble, France
- G. Kraemer is now an assistant professor at the Univ. Leipzig, Germany
- D. Svendsen is now an assistant professor in DTU, Copenhagen, Denmark

The professional development of staff trained in the group demonstrates the quality and projection research training obtained in the group. See the section Alumni in http://isp.uv.es/people.html for past visitors and ISP members.

Educational publications

- **Books**

1. E. Soria, M. Martínez, J. V. Francés, G. Camps-Valls, *Problemas De Tratamiento Digital De Señales*. Prentice Hall, Serie Prentice/Practica, 1a edición, 2003, ISBN: 84-205-3559-1.
2. J. Espí López, G. Camps-Valls, J Muñoz-Marí, *Electrónica Analógica. Problemas y Cuestiones*. Prentice Hall, Serie Prentice/Practica, 1a edición, 2006, ISBN: 84-8322-327-9.
3. J. Espí López, J. Muñoz-Marí, G. Camps-Valls, *Análisis de Circuitos*. Publicaciones de la Universidad de Valencia (PUV), 1a edición, 2006, ISBN: 84-370-6527-5.
4. J. Espí López, G. Camps-Valls, J Muñoz-Marí, *Fundamentos de Electrónica Analógica*. Publicaciones de la Universidad de Valencia (PUV), 1a edición, 2006, ISBN: 84-370-6560-7.
5. J. Espí López, G Camps-Valls, R. Magdalena, *Sintesis de Redes: impedancias y filtros*. Delta Publicaciones, SA, 1a edición, 2008, ISBN: 849245301X.

- **Dissemination journal papers**

1. E. Soria, J. Calpe, J. Chambers, M. Martínez, G. Camps-Valls, J. D. Martín-Guerrero, A novel approach to introducing adaptive filters based on the LMS algorithm and its variants, *IEEE Transactions on Education*, 47(1):127–133, April 2004, *JCR=0.526*.
2. J. D. Martín-Guerrero, L. Gómez-Chova, G. Camps-Valls, A.J. Serrano, J. Vila-Frances, J. Calpe-Maravilla, E. Soria-Olivas, Channel equalisation using a soft back-propagation learning algorithm, *Journal of Electrical Engineering*, 55(5-6):156–160, 2004.
3. G. Camps-Valls, New machine-learning paradigm provides advantages for remote sensing, *SPIE Newsroom*, July 2008.
4. J. Torres, G. Camps, V. González, E. Sanchis, A. J. Serrano, G. Torralba, Modelado de un filtro de Wiener. Implementación mediante FPGA, *Mundo Electrónico, ISSN 0300-3787*, 21(347):50–55, 2003.

- **Dissemination conferences papers**

1. E. Soria, G. Camps-Valls, A.J. Serrano, J.V. Francés, R. Magdalena, A. Albert, N.V. Jiménez, Aplicación informática para la identificación de pacientes con riesgo de intoxicación por digoxina, *XVI Congreso Anual de la Sociedad Española de Ingeniería Biomédica*, Págs. 353–356, Valencia, Sep 1998.
2. N.V. Jiménez, A. Albert, E. Soria, G. Camps-Valls, A. J. Serrano, Herramienta informática basada en redes neuronales artificiales para la prevención de toxicidad por digoxina, *II Congreso Nacional de Informática y Farmacia. Inforfarma-99*, Sevilla, Oct 1999.
3. A. Herreros, A.J. Serrano, E. Soria, G. Camps-Valls, M. Martínez, Aplicación de Support Vector Machines al problema de intoxicación por digoxina, *III Congreso de Usuarios de Matlab'99*, Págs. 313–317, Madrid, Nov 1999.
4. A. J. Serrano, M. Martínez, G. Camps-Valls, A. Rosado, Comparativa del coste computacional de aplicaciones en MATLAB, MIDEVA y ficheros C-MEX, *Congreso de usuarios de Matlab'99*, Págs. 509–513, Madrid, Nov 1999.
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- **Material for specific courses.** Through the years I edited specific material for many Master's and PhD courses: "Notes on Digital Signal Processing", "Design of Control Systems Using MATLAB-SIMULINK", "Digital Signal Processing Laboratory Manual", "Time Series Prediction Notes", "CAD Techniques Notes: Design with OrCAD: Capture & Layout. Digital Signal Processing Laboratory Manual", "Analog Electronics I Notes", "Analog Electronics I Laboratory Notes", "Theory of Electrical Networks Notes", "Analysis and Information Extraction", "Image Processing", "Statistical Signal Processing", "Hyperspectral image processing", etc. Some are available at http://www.uv.es/gcamps/teaching.html, AulaVirtual of the University of Valencia, and in the training section of the research group Image and Signal Processing (ISP) at http://isp.uv.es/courses.html.

- Teaching at the undergraduate, postgraduate, doctoral, and master's levels (national and international), and university extension.
- Teaching in doctoral programs (with honors and high-quality mention) at other universities.
- 18 courses taught, 12 initiated (theory and lab).
- Average grade throughout the teaching career: 7.28 out of 10 (8.27/10 from 2012-2019).
- 13 teaching-oriented books with ISBN.
- 14 conference presentations with a teaching focus.
- 13 articles in international journals with a teaching emphasis.
- Supervision of 12 completed doctoral theses + 19 currently under supervision
- Supervision of 36 research and master's theses.
- Teaching of 36 postgraduate university courses + 9 non-university courses.
- Participation in 7 courses for the improvement of teaching quality.

Dissemination activities

The dissemination of scientific activities in my group is crucial. Key strategies include:

1. *Publication in International Journals and Conferences:*
   - Works published in high-impact journals (Nature, Science Advances, PNAS, PLOS One).
   - Presentation in relevant conferences (NeurIPS, ICML, ECML, AGU, EGU, IGARSS, ECVP, ECCV, Climate Informatics).
2. *Attracting Stakeholders:*
   - Active participation in ELLIS and its 'Machine Learning for Earth and Climate Sciences' program.
   - Involvement in networks of excellence, COST actions, ERC Synergy Grant (USMILE), and collaboration with ESA and European Space Science (ESC).
   - Dissemination through workshops within ELLIS, influencing space agencies and organizations.
3. *A Societal Compromise:*
   - Dissemination at various levels, including engagement with kids and schools, participation in discussion panels, and active presence on social networks.
4. *Curating Data and Toolboxes:*
   - Releasing code/toolboxes and curated datasets under Findable, Accessible, Interoperable, and Reusable (FAIR) principles.
   - Open access and free publication of software and data via the dedicated GitHub site in ISP.

València, April 7, 2025
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