

MARC RUßWURM, DR.-ING.

Satellite Image Time Series | Meta-Learning

Abstract

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<i>2021 – today</i>	Postdoctoral Researcher at EPFL
<i>2018 – 2022</i>	Ph.D. Studies at TU Munich
<i>2011 – 2018</i>	Geodesy and Geoinformation Studies at TU Munich (B.Sc; M.Sc.)
<i>1991</i>	born in Germany
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<i>Google Scholar</i>	scholar.google.com/citations?user=MfGMG9wAAAAJ

Experience

<i>École polytechnique fédérale de Lausanne</i>	<i>Sept 2021</i>	Postdoctoral Researcher <i>Environmental Computational Science and Earth Observation Laboratory:</i> Research: Machine Learning and Earth Observation; Domain Shift and Transfer Learning. Self-supervised representation learning on globally distributed data.
<i>Stanford University (Visit)</i>	<i>Jan–Mar '20</i>	Visiting Researcher Palo Alto, USA <i>Lobell Lab and Sustainability and AI Lab</i> Few-Shot Meta Learning for the Remote Sensing context. Research received <i>Best Paper Award</i> at Earthvision 2020 workshop at CVPR
<i>Oxford Applied Machine Learning Group (Visit)</i>	<i>May '19</i>	Short Visit OATML Oxford, UK <i>Visit (one-week). Participation in ESA project:</i> <i>Multi-image super-resolution on Satellite Data.</i> Presentation about Machine Learning and Earth Observation.
<i>IRISA Institute (Visit)</i>	<i>Oct '18–Feb '19</i>	Visiting Researcher Vannes, France <i>Environment Observation with Complex Imagery:</i> Research stay. Early classification of time series. Multi-objective optimization (optimize accuracy and earliness).
<i>Technical University of Munich</i>	<i>2018 - 2021</i>	Research Associate and Ph.D. Candidate <i>Chair of Remote Sensing Technology:</i> Research fields: Multi-temporal Earth observation, machine learning and computer vision. Methodical work related to methods of natural language processing and applied to vegetation monitoring for Earth observation.
<i>University of Oxford & European Space Agency</i>	<i>July–Aug 2018</i>	Participant—Frontier Developments Lab <i>Kellogg College in Oxford, UK & ESRIN Φ-lab, Frascati near Rome, Italy.</i> Deep multi-resolution satellite data-fusion for disaster relief. The Frontier Developments Lab is an research and commercial accelerator composed of teams with machine learning and Earth observation background.
<i>Technical University of Munich</i>	<i>2015–2018</i>	Student Research Assistant <i>Chair of Remote Sensing Technology:</i> Tutor 3 rd MSc. Semester: Image Understanding III.

Education

<i>Dr.-Ing. (Ph.D.)</i>	2018 – Feb 2022	Technical University of Munich <i>Chair of Remote Sensing Technology:</i> Thesis: <i>Data-driven Feature Learning with Discriminative Models for Satellite Time Series</i> Ph.D. defense (23rd of February 2022)
<i>Master of Science</i>	2015–June 2018	Technical University of Munich <i>Geodesy and Geoinformation (M.Sc):</i> Machine Learning, Computer Vision, Deep Learning, Earth Observation, Remote Sensing, Photogrammetry. Thesis: <i>Multi-temporal Land Cover Classification with Recurrent-Convolutional Neural Networks</i> Cooperation: <i>Bavarian Ministry of Food, Agriculture and Forestry (StMELF).</i>
<i>Bachelor of Science</i>	2011–2015	Technical University of Munich <i>Geodesy and Geoinformation (B.Sc):</i> Photogrammetry, Remote Sensing, Surveying, Cartography, Geo-informatics, Gravity Science, GNSS Science, and Land Management. Thesis: <i>Tri-ocular Image Rectification and Photogrammetric Reconstruction</i>

Scientific Involvement

<i>Peer Review</i>		Transactions on Geoscience and Remote Sensing (TGRS); Elsevier Remote Sensing of Environment (RSE); Geoscience and Remote Sensing Letters (GRSL); ISPRS Journal of Photogrammetry and Remote Sensing; IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS); International Geoscience and Remote Sensing Symposium (IGARSS); Earthvision workshop at Conference on Computer Vision and Pattern Recognition (CVPR)
<i>Program Committee (2019-2022)</i>		MACHine Learning for EArth ObservatioN (MACLEAN) workshop at ECML/PKDD

Awards

<i>June 2020</i>	Best paper - Earthvision Workshop at Computer Vision and Pattern Recognition Workshop (2020) (link)
<i>Oct. 2017</i>	Best presentation - NVIDIA Deep Learning Workshop at Leibnitz Supercomputing Center (LRZ)
<i>July 2017</i>	Best paper - Earthvision Workshop at Computer Vision and Pattern Recognition Workshop (2017) (link)
<i>Sept. 2016</i>	Best presentation - Polish-National Remote Sensing Conference (link)

Grants (Mobility)

<i>March 2020</i>	DAAD-IFI Stipend for Research Stay at Lobell Lab, Stanford University
<i>June. 2019</i>	Travel Grants ICML Workshops on <i>AI for Social Good</i> and <i>Time Series</i>
<i>May. 2019</i>	Google Education Credits - 5k\$ in Google Credits for Crop Type Mapping
<i>June 2017</i>	Travel grant - of International Society for Photogrammetry and Remote Sensing (ISPRS) (link)

Teaching

<i>ISPRS Congress (2022)</i>	Deep Learning for Satellite Time Series (Tutorial Session)
<i>Excercises (TUM; 2017–2018)</i>	Image Understanding III
<i>Advised Master Thesis</i>	Laura Pasero; Corinna Frank
<i>Advised Projects</i>	Arthur Chevalley; Max Zollner; Jennifer Kriese

Invited Talks

presentations	a list of all available presentations and conference talks available here
2021-11-10	Data-Driven Vegetation Modeling and Understanding Representation Shift at Lasig Seminar: Deep Learning for Earth Sciences organized by Loic Landrieu
2021-07-08	Early Classification for Agricultural Monitoring at ANR Seminar organized by Romain Tavenard, Univ Rennes 2
2020-07-07	BreizhCrops: A Satellite Time Series Crop Type Dataset at MADICS MACLEAN workshop
2019-05-03	Earth Observation and Machine Learning: From Language Model to Earth Model: Visiting OATML Lab of Yarin Gal

Selected Publications

Google Scholar	scholar.google.com/citations?user=MfGMG9wAAAAJ
2021	Mifdal, J., Carmo R., Rußwurm M. (2021). Towards detecting floating objects on a global scale with learned spatial features using Sentinel 2. <i>ISPRS Ann. Photogramm. Remote Sens. Spatial Inf. Sci.</i> , V-3-2021, 285–293, 2021, 169:421 – 435.
2020	Rußwurm , M. and Körner, M. (2020). Self-attention for raw optical satellite time series classification. <i>ISPRS Journal of Photogrammetry and Remote Sensing</i> , 169:421 – 435. Rußwurm , M., Wang, S., Körner, M., and Lobell, D. (2020). Meta-learning for few-shot land cover classification. In <i>2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)</i> , pages 788–796. EarthVision 2020 Best Paper Award. Wang, S., Rußwurm , M., Körner, M., and Lobell, D. (2020). meta-learning for few-shot time series classification. In <i>2020 IEEE International Geoscience and Remote Sensing Symposium, IGARSS 2020</i> . IEEE. Nominated best Student Paper IGARSS 2020.
2019	Tim G. J. Rudner, Marc Rußwurm et al. Multi ³ net: Segmenting flooded buildings via fusion of multiresolution, multisensor, and multitemporal satellite imagery, <i>Proceedings of the AAAI Conference on Artificial Intelligence</i> . Vol. 33. No. 01. 2019. 2019.
2018	Marc Rußwurm and Marco Körner. Multi-Temporal Land Cover Classification with Sequential Recurrent Encoders, <i>ISPRS International Journal of Geo-Information</i> , 2018. (link)
2017	Marc Rußwurm and Marco Körner. Temporal Vegetation Modelling using Long Short-Term Memory Networks for Crop Identification from Medium-Resolution Multi-Spectral Satellite Images, <i>In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops 2017</i> . (best paper award, PDF)