Nico Lang

Date of birth:	24th of January 1992
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Education

02/2018 – 05/2022	**PhD student in the Photogrammetry and Remote Sensing group at ETH Zürich.** Supervisors: Prof. Konrad Schindler and Prof. Jan Dirk Wegner Thesis: Mapping Vegetation Height — Probabilistic Deep Learning for Global Remote Sensing
09/2015 – 09/2017	**Master of Science ETH in Geomatics** Majors: Engineering Geodesy and Photogrammetry, Space Geodesy and Navigation Master Thesis: Deep learning and Google Maps for tree monitoring
09/2011 – 08/2014	**Bachelor of Science ETH in Geomatik und Planung** Majors: Geodäsie und Geodätische Messtechnik, GIS, Photogrammetrie und Kartografie Bachelor Thesis: Klassifizierung von Gebäudefassaden in einer Laserscan-Punktwolke

Research and work experience

09/2022 – Present	**Postdoc at the Department of Computer Science (DIKU), University of Copenhagen affiliated with the Pioneer Centre for AI** Advisors: Prof. Serge Belongie and Prof. Christian Igel Research topics: Open-set recognition, Fine-grained categorization, Multi-modal representation learning, Deep learning for environmental monitoring.
02/2018 – 05/2022	**Research assistant – Photogrammetry and Remote Sensing group (ETH Zürich)** Supervision of several Bachelor and Master theses, Teaching assistant in Photogrammetry
02/2016 – 10/2017	**Research assistant – Photogrammetry and Remote Sensing group (ETH Zürich)** Project: *RegisTree* (https://registree.ethz.ch/) in cooperation with Pietro Perona's Computational Vision group at Caltech
02/2015 – 04/2015	**Internship at Computer Vision R&D, LOGITECH UPICTO GmbH**
10/2014 – 01/2015	**Internship as Computer Vision Developer, upicto GmbH (Spinoff ETH Zürich)**
03/2013 – 05/2014	**Research Assistant – Photogrammetry and Remote Sensing group (ETH Zürich)** Processing and labelling of the ISPRS benchmark Potsdam and Vaihingen

Professional activities

Organizer (main point of contact) of the FGVC10: 10th Workshop on Fine-grained Visual Categorization at CVPR2023, Vancouver.

Organizer of the Visipedia workshop 2024 at the Pioneer Centre for AI, Copenhagen.

Organizer (main point of contact) of the FGVC11: 11th Workshop on Fine-grained Visual Categorization at CVPR2024, Seattle.

Organizer of the summer PhD course SSL4EO: Self-Supervised Learning for Earth Observation at the University of Copenhagen.

Panelist at the Machine Learning for Remote Sensing workshop at ICLR2024, Vienna.

Reviewer for CVPR23, CVPR24, ECCV24, RSE, ISPRS, Nature Comms. Env., CompSust-2023 NeurIPS workshop, etc.

Talks at AI2, RISE, AI for Good, ESA LPS22, Alan Turing Institute, Google Geo for Good, HCSA, ESA Phi-lab.

Drummer in the CVPR 2023 house band in Vancouver.

Teaching experience

02/2018 – 05/2022	**Teaching assistant - Photogrammetry and Remote Sensing group (ETH Zürich)** Photogrammetry lecture: designing and assisting practical lab exercises, Supervision of several student theses (Bachelor and Master level)

	Tutorials on "Deep Learning for Geospatial Data Analysis"
09/2019	Practical tutorial, ECML/PKDD Summer School (EPSS19) in Würzburg, Germany.
06/2019	Lecture and practical tutorial, ISPRS Geospatial week in Enschede, Netherlands.
01/2019	Practical tutorial, 1st Swiss "Workshop on Machine Learning for Environmental and Geosciences" (MLEG2019) in Zürich, Switzerland.
01/2018	Practical tutorial, ISPRS Technical Commission II Symposium 2018 in Riva, Italy.
03/2013 – 09/2017	**Teaching assistant at ETH Zürich** Geodätische Messtechnik Grundzüge, Geographic Information Systems (GIS)
08/2010 – 08/2017	**Teaching Volleyball (J+S school sport) at several schools in Switzerland**

Publications

Journals and Conferences

Nedungadi, V., Kariryaa, A., Oehmcke, S., Belongie, S., Igel, C., & **Lang, N.** (2024) MMEarth: Exploring Multi-Modal Pretext Tasks For Geospatial Representation Learning. *In European Conference on Computer Vision (ECCV).*

Zhao, B., **Lang, N.**, Belongie, S., & Mac Aodha, O. (2024). Labeled Data Selection for Category Discovery. *In European Conference on Computer Vision (ECCV).*

Lang, N., Snæbjarnarson, V., Cole, E., Mac Aodha, O., Igel, C., & Belongie, S. (2024). From Coarse to Fine-Grained Open-Set Recognition. *In Proceedings of the IEEE/CVF conference on Computer Vision and Pattern Recognition (CVPR)*.

Lang, N., Jetz, W., Schindler, K., & Wegner, J. D. (2023). A high-resolution canopy height model of the Earth. *Nature Ecology & Evolution*, *7*(11), 1778-1789.

Liu, S., Brandt, M., Nord-Larsen, T., Chave, J., Reiner, F., **Lang, N**., ... & Fensholt, R. (2023). The overlooked contribution of trees outside forests to tree cover and woody biomass across Europe. *Science Advances*, *9* (37).

Kalischek, N**., Lang, N.**, Renier, C., Daudt, R. C., Addoah, T., Thompson, W., ... & Wegner, J. D. (2022). Satellite-based high-resolution maps of cocoa for Côte d'Ivoire and Ghana. *Nature Food*.

Becker, A., Russo, S., Puliti, S., **Lang, N.**, Schindler, K., & Wegner, J. D. (2023). Country-wide retrieval of forest structure from optical and SAR satellite imagery with deep ensembles. *ISPRS Journal of Photogrammetry and Remote Sensing*, *195*, 269-286.

Lang, N., Kalischek, N., Armston, J., Schindler, K., Dubayah, R., & Wegner, J. D. (2022). Global canopy height regression and uncertainty estimation from GEDI LIDAR waveforms with deep ensembles. *Remote Sensing of Environment*, 268, 112760.

Lang, N., Irniger, A., Rozniak, A., Hunziker, R., Wegner, J. D., & Schindler, K. (2021). GRAINet: mapping grain size distributions in river beds from UAV images with convolutional neural networks. *Hydrology and Earth System Sciences*, 25(5), 2567-2597.

Laumer, D., **Lang, N.**, van Doorn, N., Mac Aodha, O., Perona, P., & Wegner, J. D. (2020). Geocoding of trees from street addresses and street-level images. *ISPRS Journal of Photogrammetry and Remote Sensing*, 162, 125-136.

Lang, N., Schindler, K., & Wegner, J. D. (2019). Country-wide high-resolution vegetation height mapping with Sentinel-2. *Remote Sensing of Environment*, 233, 111347.

Kälin, U., **Lang, N.**, Hug, C., Gessler, A., & Wegner, J. D. (2019). Defoliation estimation of forest trees from ground-level images. *Remote Sensing of Environment*, 223, 143-153.

Branson, S., Wegner, J. D., Hall, D., **Lang, N.**, Schindler, K., & Perona, P. (2018). From Google Maps to a fine-grained catalog of street trees. *ISPRS Journal of Photogrammetry and Remote Sensing*, 135, 13-30. (**Awarded best paper ISPRS Journal 2018**)

Preprints

Guthula, V. B., Oehmcke, S., Chilaule, R., Zhang, H., **Lang, N.**, Kariryaa, A., ... & Igel, C. (2024). Nacala-Roof-Material: Drone Imagery for Roof Detection, Classification, and Segmentation to Support Mosquito-borne Disease Risk Assessment. *arXiv preprint arXiv:2406.04949*.

Lang, N., Schindler, K., & Wegner, J. D. (2021). High carbon stock mapping at large scale with optical satellite imagery and spaceborne LIDAR. *arXiv preprint arXiv:2107.07431*.

Workshop papers, Abstracts, Magazines

Gordon, L., **Lang N.**, Ressijac C., Davies A. (2024). Multimodal Fusion Strategies for Mapping Biophysical Landscape Features. *In European Conference on Computer Vision (ECCV) Workshop proceedings - CV For Ecology Workshop (CV4E).*

Enevoldsen, P., Gundersen C., **Lang N.**, Belongie S., Igel C. (2023). Familiarity-Based Open-Set Recognition Under Adversarial Attacks. *In The 2nd Workshop and Challenges for Out-of-Distribution Generalization in Computer Vision, International Conference on Computer Vision (ICCV)*

Lang, N., Schindler K., Wegner, J. D. (2022, May). Forest canopy height mapping at global scale by fusing Sentinel-2 and GEDI. *In ESA Living Planet Symposium 2022. (oral talk)*

Kalischek, N., **Lang, N.**, Daudt, R. C., Addoah, T., Thompson, W., Blaser-Hart, W. J., ... & Wegner, J. D. (2022, May). Towards traceable, transparent and sustainable cocoa farming in Côte d'Ivoire and Ghana using publicly available satellite imagery and deep learning. *In ESA Living Planet Symposium 2022.*

Rüetschi, M., Jiang, Y., **Lang, N.**, Becker, A., Waser, L. T., Marty, M., ... & Ginzler, C. (2022, May). Annual vegetation height maps based on Sentinel-2 data-Potential applications for the Swiss National Forest Inventory. *In ESA Living Planet Symposium 2022.*

Nassar, A. S., **Lang, N.**, Lefèvre, S., & Wegner, J. D. (2019, May). Learning geometric soft constraints for multi-view instance matching across street-level panoramas. *In Joint Urban Remote Sensing Event (JURSE) (pp. 1-4). IEEE.*

Lang, N., Wegner, J. D., & Schindler, K. (2019, May). Mapping Vegetation Height from Multispectral Sentinel-2 Images at Country Scale using Deep Learning. *In ESA Living Planet Symposium 2019.*

Lang, N., Ginzler, C., Schindler, K., & Wegner, J. D. (2019). Landesweite Vegetationshöhenmodelle mit Deep Learning und Sentinel-2. *In Geomatik Schweiz, 2019(9), 256-259.*

Selected News Media

German national TV "ARD" presents our global canopy height map in the quiz show "Wer Weiss Denn Sowas". [video] (2022)

Swiss national TV "SRF" in the news program "10 vor 10": «Living Planet Symposium» mit Schweizer Beteiligung. (2022)

News article by NASA: "Scientists Show How Forests Measure Up" (2022)

News article by NVIDIA: "Neural Network Generates Global Tree Height Map, Reveals Carbon Stock Potential" (2022)

News article by ETH Zürich: "Neuronales Netzwerk kann Baumhöhen von Satellitenbildern ablesen" [English version] (2022)

Live radio interview with the Swiss national radio SRF1: "Die Vermessung der Wälder (Measuring the forests)" (2021)

News article by Mongabay: "Chocolate giant funds high resolution carbon map to protect forests" (2021)

News article by the High Carbon Stock Approach: "Publicly available indicative High Carbon Stock Forest maps for Malaysia, Indonesia, and the Philippines" (2021)

News article by ETH Zürich Industry Relations: "A global tool against deforestation" (2020)

Grants and Awards

07/2023	**The Culmann Prize (ETH Zürich)** The Culmann Prize, named after the German-Swiss civil engineer Carl Culmann (1821-81), recognizes outstanding doctoral theses and includes a financial award.
06/2023	**CVPR 2023 Outstanding Reviewer** For exceptional efforts in reviewing for the Computer Vision and Pattern Recognition Conference 2023.
03/2019	**The U.V. Helava Award for best paper 2018 in ISPRS Journal of Photogrammetry and Remote Sensing** (with Jan D. Wegner, Konrad Schindler, and Steve Branson, David Hall, Pietro Perona from the Caltech Computational Vision Group)
08/2016	**Degen Stiftung (ETH Zürich) for travel costs** Summer research visit to California Institute of Technology (Caltech), Los Angeles (Ca, USA), in the course of the interdisciplinary project thesis during the 3rd Master semester.
03/2015	**Awarded for entering the final round of the Karl-Kraus-Nachwuchsförderpreis** Shortpaper about the Bachelor thesis on the classification of building facades in point clouds

Programming skills Python (main), Bash, Matlab | Pytorch (main), Keras, GDAL

Cluster skills Slurm, IBM LSF (Load Sharing Facility) batch system, Amazon Web Services (AWS Batch)

Software experience	LaTeX, QGIS**,** GDAL, ArcGis, Photoshop, Illustrator, Metashape, Inpho, Faro-Scene, MS Office
Languages	German (mother tongue), English
Interests	I enjoy spending my free time outdoors hiking, snowboarding, kitesurfing, and playing volleyball. I play the drums and like making music with others, also at conferences.
References	References are available upon request.

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