Valerie Zermatten

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PhD Student at EPFL in Remote Sensing, Machine Learning, AI for Conservation.

Education

EPFL - Sion, Switzerland November 2021 - April 2026
PhD Candidate in the Environmental Computational Science and Earth Observation Laboratory (ECEO).
I work at the intersection of computer vision and natural language processing and integrate multiple data sources (e.g., species observations, satellite images, text and environmental rasters). I focus on integrating knowledge from text to better understand remote sensing images. I am supervised by Prof. Devis Tuia at EPFL and Prof. Diego Marcos from INRIA, Montpellier (France). I also collaborate with the Federal Office of Topography swisstopo, to develop interactive methods for mapping Switzerland at scale.

Université de Montpellier - Montpellier, France September 2024 - March 2025
Academic visit in the EVERGREEN team at Maison de la Télédétection and at INRIA.

EPFL - Lausanne, Switzerland September 2018 - January 2021
M.Sc. Environmental Sciences and Engineering with a specialisation in Monitoring and Modelling of the environment. Master project title: *Predicting Land Usage from Aerial Images with Deep Learning: A Case Study in the Valaisan Alps focusing on Class Imbalance.*

EPFL - Lausanne, Switzerland September 2015 - September 2018
B.Sc. Environmental Sciences and Engineering.

Nanyang Technological University (NTU) - Singapore August 2017 - June 2018
Academic exchange: Civil and Environmental Engineering.

Research

Integrating Remote Sensing and Text Data in a Spatial Neighbourhood to Predict Environmental Variables. **V. Zermatten**, C. Vanalli, G. Sumbul, D. Marcos, D. Tuia. Under Review.

EcoWikiRS: Learning Ecological Representations of Satellite Images from Weak Supervision with Species Observations and Wikipedia. **V. Zermatten**, J. Castillo-Navarro, P. Jain, D. Tuia, D. Marcos. Proceedings of CVPRW (EarthVision), 2025.

Learning transferable land cover semantics for open vocabulary interactions with remote sensing images. **V. Zermatten**, J. Castillo-Navarro, D. Marcos, D. Tuia. ISPRS Journal of Photogrammetry and Remote Sensing, 2025.

Land Cover Mapping From Multiple Complementary Experts Under Heavy Class Imbalance. **V. Zermatten**, X. Lu, J. Castillo-Navarro, T. Kellenberger, D. Tuia. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 2024.

Prompt–RSVQA: Prompting visual context to a language model for Remote Sensing Visual Question Answering. C. Chappuis, **V. Zermatten**, S. Lobry, B. Le Saux, D. Tuia. Proceedings of CVPRW (EarthVision), 2022.

Professional Experience

SBB CFF FFS (Swiss Federal Railway) - Luzern, Switzerland March - September 2021
Trainee at the Centre of Competence for Drones. Led data acquisition with drones for high precision mapping in proximity to the railways network. Analysed InSAR data over the entire Swiss railways network to detect soil movements.

République et canton du Jura - Switzerland (Remote position) June - September 2020
Trainee at the Office of the Environment (ENV) for the canton of Jura. Analysis of beech tree dieback on Sentinel-2 data and fieldwork to compare actual tree condition with estimated values.

Other Academic Duties:

Teaching Assistant. Responsible for preparing and delivering exercise sessions, and for designing and grading exams and course projects for two courses: Image Processing for Earth Observation (Master level; 2022,2023,2025), Elements de Géomatique (Bachelor level; 2025).

Supervision of Graduate and Undergraduate Students. Supervision of four master theses (X. Lu, N. Santacrocce, J. Leuenberger, M. Bruhlman), one Design Project (with SBB CFF FFS) and one Bachelor Project (A. Rufer).

Reviewer.
Journals: Journal of Selected Topics in Applied Earth Observations and Remote Sensing, Methods in Ecology and Evolution.
Conference: Machine Vision for Earth Observation and Environment Monitoring (MVEO workshop at BMVC) 2025, MAChine Learning for EArth ObservatioN (MACLEAN workshop at ECML/PKDD) 2025, Computer Vision for Ecology (CV4E workshop at ICCV) 2025.

Skills & Tools:

Core: Python (scikit-learn, PyTorch, pandas), R, Matlab, Git, Linux.
Geospatial: QGIS, gdal, shapely, fiona.
Language: French (native-C2), English (professional-C2), German (conversational-B2).

Awards and Achievements

Swiss Society of Engineers and Architects (SIA) Price 2021: best master thesis in Environmental Sciences and Engineering.
swisstopoEDU Recognition Award 2021 : for my master thesis.