

Yuri GELSLEICHTER

Researcher in Soil and Geomatics

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i Nationality: Luxembourgish, Brazilian

Soil and Geomatics Researcher with a Ph.D. in Science, Technology, and Innovation in Agriculture. Expert in **Digital Soil Mapping**, AI-driven **Machine Learning**, Remote Sensing and **Geographic Information System (GIS)** with R, Python, Quantum GIS and Google Earth Engine (JavaScript). Published 12+ peer reviewed articles (100 citations January 2026, h-index 7) and contributed to Open Science projects like Soils4Africa and OSIRIS. Skilled in Open source GIS (QGIS, GDAL, R packages like terra, SF, RSAGA), data visualization, and computational reproducibility. International collaboration across the Americas, Europe, Africa, and Oceania.

SKILLS

Programming	R programming, Javascript-Google Earth Engine-GEE, Bash-Linux, Git, Artificial Intelligence, Big Data, Cloud Computing, Python, SQL
HPC experience	NCAR-Derecho, emory-Saikawa, NERSC
GIS Software	GDAL, QGIS, SAGA-GIS, GRASS
Data Science	Soil Spectral Analysis, Applied AI-driven machine learning to soil property prediction, ETL tools: [extraction, transform, and load data], Data Management, Data Visualization, Multivariate Analyses
Digital Skills	Digital Soil Mapping, Hyperspectral Soil Mapping, R Programming, Geographic Information System-GIS, Soil Spectroscopy, Machine Learning with Python and R, Remote Sensing, Soil Classification
Interdisciplinary	Environmental Science, Agricultural Innovation, Precision Agriculture, Science Reproducibility, Methodology Development
Soft Skills	Team Collaboration, Problem-Solving, Facilitated international collaborations and communication as part of the Soil Judging committee in The International Union of Soil Sciences (IUSS).

EXPERIENCE

Current Feb 2021	Research, post-doc Hungarian University of Agriculture and Life Sciences (MATE), GÖDÖLLŐ, Hungary <ul style="list-style-type: none">> Researching soil classification, mapping, and spectral characterization.> Taught 60+ graduate students in R programming courses and 40+ in soil amelioration, and protection.> Advising two doctoral students in Digital Soil Mapping and two in Soil Spectroscopy.> International collaboration: USA, Brazil, Australia, Hungary, Namibia, Kenya, Tanzania, The Netherlands. <div>R Javascript-Google Earth Engine Teaching</div>
Feb 2021 Aug 2020	Data Scientist Just.bi, SÃO PAULO, Brazil <ul style="list-style-type: none">> Designed sampling data for analytical models.> Implemented Machine Learning models for data analysis and time series.> Developed Recency, Frequency, Value (RFV) models to enhance customer insights.
Jan 2019 Aug 2019	Research Guest ISRIC, WAGENINGEN, Netherlands <ul style="list-style-type: none">> Developed land cover change scenarios for predicting carbon stock in Argentina.> Mapped large areas using advanced GIS and remote sensing techniques.> Collaborated with international teams on soil data projects.
Jun 2018 Sep 2017	Graduate Exchange Student Szent István University (now MATE), GÖDÖLLŐ, Hungary <ul style="list-style-type: none">> Contributed to the Universal Soil Classification System.> Created taxa centroids to compare WRB and Brazilian Soil Classification systems.> Engaged in the Stipendium Hungaricum Program for international study.

- Mar 2016 Ph.D. in Science, Technology, and Innovation in Agriculture (Federal Rural University of Rio De Janeiro
Mar 2020 (UFRRJ), Seropédica, Brazil)
- > Specialized in soil classification, mapping, and spectral characterization.
 - > Developed expertise in R programming, machine learning, and data analytics.
 - > Engaged in research projects enhancing computational reproducibility.
- Aug 2009 B.Sc. in Environmental and Sanitary Engineering (University of Southern Santa Catarina (UNISUL), Palhoça,
Aug 2015 Brazil)
- > Acquired foundational knowledge in environmental engineering principles.
 - > Participated in projects on environmental sustainability and sanitation.
 - > Completed coursework emphasizing geomatics and coding applications.

 PUBLICATIONS**Awareness and adoption strategies for improved agricultural practices (IAPs) by smallholder farmers in the Mbeya Region, Tanzania** 2025

Phenson Justine, Ádám Csorba, Caleb Melenya Ocansey, Brian Rotich, Isaiah Maket, Azaria Stephano Lameck, Mustapha Abdulkadir, Mohammed Ahmed MohammedZein, Erika Michéli, Yuri Andrei Gelsleichter

DOI: [10.1007/s43621-025-00970-y](https://doi.org/10.1007/s43621-025-00970-y)

Assess smallholder farmers' awareness and adoption of improved agricultural practices (IAPs)

Variation of Soil Organic Carbon and Total Nitrogen Stocks across elevation gradients and soil depths in the Mount Kenya East Forest 2025

Brian Rotich, Tamás Szegi *, Yuri Andrei Gelsleichter, Márta Fuchs, Caleb Melenya Ocansey, Justine Nsima Phenson, Mustapha Abdulkadir, Harison Kipkulei, Amos Wawire, Evans Mutuma, Samuel Ayodele Mesele, Erika Michéli, Ádám Csorba

DOI: [paper-accepted/doi-in-progress](https://doi.org/paper-accepted/doi-in-progress)

Soil organic carbon and total nitrogen stocks in the Mount Kenya East Forest vary significantly with elevation and soil depth, reflecting complex interactions between topography, vegetation, and soil properties.

Spectroscopy Supported Definition and Classification of Sandy Soils in Hungary 2024

Erika Michéli, Márta Fuchs, Yuri Gelsleichter, Mohammed Zein, Ádám Csorba

DOI: [10.1016/j.geodrs.2023.e00641](https://doi.org/10.1016/j.geodrs.2023.e00641)

Analyses of taxonomic relations and distances comparing centroids calculated from legacy laboratory data and MIR spectral data of the Hungarian Soil Information and Monitoring System – Book chapter of Sandy Soils; Springer.

Enhancing Soil Mapping with Hyperspectral Subsurface Images generated from soil lab Vis-SWIR spectra tested in southern Brazil 2023

Gelsleichter, Y.A.; Costa, E.M.; Anjos, L.H.C.; Marcondes, R.A.T.

DOI: [10.1016/j.geodrs.2023.e00641](https://doi.org/10.1016/j.geodrs.2023.e00641)

Developed Hyperspectral Soil Mapping by integrating lab-based Vis-SWIR spectra with Digital Soil Mapping to improve soil property predictions. Utilized Random Forest algorithm with k-fold cross-validation, achieving enhanced prediction accuracy for Total Carbon content in soils. Applicable in agriculture and conservation.

Past and Future Responses of Soil Water to Climate Change in Tropical and Subtropical Rainforest Systems in South America 2023

Arévalo, S.M.M. et al.

DOI: [10.3390/atmos14040755](https://doi.org/10.3390/atmos14040755)

Assessed impacts of land use and climate change on South America's tropical longleaf forests using ARIMA models for soil moisture and future climate scenarios. Identified regional trends and vulnerabilities, contributing to targeted forest preservation strategies.

Degradation of South American biomes: What to expect for the future? 2022

Delgado, R.C.; Santana, R.O.; Gelsleichter, Y.A.; Pereira, M.G.

DOI: [10.1016/j.eiar.2022.106815](https://doi.org/10.1016/j.eiar.2022.106815)

Analyzed 18 years of meteorological, biophysical, and fire variables to study vegetation dynamics across South American biomes, forecasting trends until 2040. Predicted increased air temperatures will intensify evaporation, transpiration, and mega-fires, signaling a need to prevent biodiversity loss.

Mapping soil properties in a poorly-accessible area 2020

Costa, E.M.; Pinheiro, H.S.K.; Anjos, L.H.C.; Marcondes, R.A.T.; Gelsleichter, Y.A.

DOI: [10.36783/18069657rbcs20190107](https://doi.org/10.36783/18069657rbcs20190107)

Conducted soil mapping in the remote Itatiaia National Park focusing on properties like pH, carbon content, and CEC using Digital Soil Mapping tools. Employed conditioned Latin Hypercube Sampling and compared linear and nonlinear models for calibration.

Spatial Bayesian belief networks: a participatory approach for mapping environmental vulnerability at the Itatiaia National Park, Brazil 2020

Costa, E.M.; Pinheiro, H.S.K.; Anjos, L.H.C.; Gelsleichter, Y.A.; Marcondes, R.A.T.

DOI: [10.1007/s12665-020-09099-9](https://doi.org/10.1007/s12665-020-09099-9)

Implemented a Bayesian Belief Network to assess environmental vulnerability using data like soils, land use, climate, and relief.

Identified areas of fragility based on environmental factors, providing actionable insights for park management.

List of publications in [Google scholar](#)

ONGOING PUBLICATIONS

Submitted

- › Digital Soil Mapping of Soil Carbon at Eastern slopes of Mount Kenya
Yuri Gelsleichter, Áttila Toth, Erika Micheli, Ádám Csorba

Writing phase

- › Mapping soil properties and classes of Namibia with Google Earth Engine
Marina Coetze, **Yuri Gelsleichter**, Marta Fuchs, Ádám Csorba, Erika Michele
- › Predicting soil properties with MIR spectra in Tanzania
Justine Phenson, **Yuri Gelsleichter**, Ádám Csorba, Erika Michele
- › Geological mapping of Southern state of Minas Gerais Brazil
Yuri Gelsleichter, Diego Gomes, Michele Duarte, Nilton Curi

Data processing

- › Mapping SOC NEON sites with High spectral and spatial resolution in HPC
Yuri Gelsleichter, Samantha Weintraub-Leff, Shashi Konduri, Jitendra Kumar, Debjani Sibi

PROJETS

SOILS 4 AFRICA

2024 - CURRENT

 <https://www.soils4africa.eu/>

Soils4Africa aims to put in place an Open-data Soil Information System, to improve sustainable intensification of agriculture and boosting food security; by improving the quality and availability of African soil data.

–Participation: Active assistance in Portuguese-speaking countries. Gave training in Minimalist Reference Sites sampling collection for 22 participants. Protocol and field survey translation. Assistance for field surveyors of Portuguese-speaking.

Africa Soil Information System Open-data

OSIRIS

2023 - 2027

 <https://osiris4r.eu/>

Open Science to Increase Reproducibility In Science (OSIRIS) aims to facilitate this shift by systematically gathering knowledge on the underlying drivers, testing effective evidence-based solutions, identifying incentives for reproducibility by stakeholders, and embedding reproducibility in research design.

–Participation: Implemented and analyzed a survey to gather the current barriers and motivations for Computational Science Reproducibility; Collaborated in the development of a checklist for science reproducibility, also with the implementation of a Delphi Survey in LimeSurvey platform, where the results were applied within the project.

Reproducibility Open-data Open-code

TEACHING

Soil Mapping

Oct 2022 – Current

Hungarian University of Agriculture and Life Sciences (MATE), Gödöllő, Hungary

- › Conducted soil mapping projects using R programming.
- › Supervised undergraduate students in data collection and analysis.
- › Integrated digital soil mapping techniques into curriculum.

Introduction to R Programming Course

Feb 2022 – Current

Hungarian University of Agriculture and Life Sciences (MATE), Gödöllő, Hungary

- › Developed and taught a 25-hour graduate-level course on R programming.
- › Covered data analysis and visualization techniques.
- › Enhanced students' proficiency in coding.

Soil Properties prediction with Vis-NIR, MIR

Nov 2024 – Jan 2025

Hungarian University of Agriculture and Life Sciences (MATE), Gödöllő, Hungary

- › Data preparation and data shaping to modeling.
- › Machine learning modeling to predict soil properties.
- › Advanced validation strategies.

(Online) Data Analysis and Visualization in R Applied to Agronomy and Soil Sciences

Oct 2020

Federal Rural University of Rio de Janeiro (UFRRJ)

- › Provided a 60-hour graduate-level online course focusing on R for agronomy.
- › Emphasized soil data analysis and visualization.
- › Facilitated remote learning during pandemic restrictions.

Data Analysis and Visualization in R Applied to Agronomy and Soil Sciences

Jun 2019

Federal Rural University of Rio de Janeiro (UFRRJ)

- › Conducted a 60-hour in-person course for graduate students.

- › Guided students through practical applications of R in soil sciences.
- › Encouraged adoption of open-source tools for research.

VOLUNTEERING

International Soil Judging – Co-chair of Communication working group	Sep 2024 – current
World wide	
› Establish communication channels with National teams.	
22nd World Congress of Soil Science	Aug 2022
Scotland	
› Assisted during the event, ensuring smooth operations and participant support.	
4th International Soil Judging Contest - Stirling	Aug 2022
Scotland	
› Collaborated on the organization, including site preparation and profile development for participants.	
Wageningen Soil Conference	Aug 2019
Netherlands	
› Coordinated tasks and managed team members to facilitate conference activities.	
21st World Congress of Soil Science	Aug 2018
Rio de Janeiro, Brazil	
› Collaborated with the organizing committee, providing assistance throughout the event.	
3rd International Soil Judging Contest - Seropédica	Aug 2018
Rio de Janeiro, Brazil	
› Assisted in organizing the event, including site setup and profile preparation for participants.	