# Ruhollah **Taghizadeh**

POSTDOC RESEARCHER

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## About me

My primary research interest is in **Pedometrics** with a particular focus on **Digital Soil Mapping**. The core of the pedometric approach integrates soil system knowledge with **Machine Learning**, advanced statistical methods, **Geospatial Data Analysis**, and **Remote Sensing**. I apply the most recent technology in spatial data analysis to model and predict various environmental metrics such as soils, water, vegetation, and climate.

## Experience

**Department of Geosciences, University of Tübingen, Germany** — 2017-Present
Postdoc Researcher

**Department of Plant Science, South Dakota State University, USA** — 2016
Postdoc Researcher *(three months)*

**Faculty of Agriculture, Ardakan University, Iran** — 2013-2017
Assistant Professor

**Department of Soil and Water, Agricultural Research Center, Iran** — 2010-2011
Geospatial Consultant

## Education

**Faculty of Agricultural Engineering and Technology, University of Tehran, Iran** — 2012
Doctor of Philosophy in Agricultural Engineering-Soil Science

**Sydney Institute of Agriculture, The University of Sydney, Australia** — 2012
Postgraduate Visiting Scholar in Digital Soil Mapping *(six months)*

**Faculty of Agricultural Engineering and Technology, University of Tehran, Iran** — 2008
Master of Science in Agricultural Engineering-Soil Science

**Faculty of Agriculture, SB University of Kerman, Iran** — 2005
Bachelor of Science in Agricultural Engineering-Soil Science

## Projects

**German Research Foundation** — 2022
Sensitivity and Response of Himalayan Timberline Ecotones to Global Warming *(Collaborator)*

**German Research Foundation** — 2020
Transferability of Machine Learning for Soil Mapping *(Collaborator)*

**Iranian Agricultural Research, Education & Extension Organization** — 2019
Digital Soil Mapping in Kurdistan *(Collaborator)*

**Alexander von Humboldt Foundation** — 2017
Digital Soil Mapping with Limited Data *(Principal Investigator)*

## Research Interests

Pedology; Digital Soil Mapping, Remote and Proximal Sensing, Geographic Information System, Geospatial Data Analysis, Data Science, Machine Learning, Statistical Inference, Soil Health, Climate Change, Precision Agriculture

## Teaching

**Teaching Assistant at University of Tübingen, Germany** — 2020-Present
- Spatial Pedology and Geomorphology (GEO76) — GS
- Statistics (GEO25) — UGS

**Workshop Lecturer**
- An Overview of Statistical Programming with R, University of Tübingen *(two hours-online)* — 2023
- An introduction to Spatial Analysis in QGIS, University of Tübingen *(two hours-online)* — 2022
- An introduction to GIS, University of Tübingen *(two hours-online)* — 2022
- Spatial Data Analysis in R, Iranian Soil & Water Research Institute 🌐 *(seven days-online)* — 2021
- Digital Soil Mapping in R, Iranian Soil & Water Research Institute *(two days)* — 2016
- Data Mining in Soil Sciences, Iranian Soil & Water Research Institute *(two days)* — 2016

## Fellowships, Honors, Awards

Five Nominated Pedometrics Best Paper — 2020
Alexander von Humboldt Postdoctoral Fellowship — 2017
Lecturer Award at Ardakan University — 2017

## Professional Services

Award Committee Member of the Pedometrics Commission — 2022-Present
Executive Board Member of International Soil Modeling Consortium — 2022-Present
Associate Editor of Frontiers in Soil Science/Pedometrics — 2022-Present
Webmaster of Pedometrics Homepage — 2022-Present

## Professional Training

Professional Data Scientist, DataCamp — 2023
Statistician with R, DataCamp — 2023
Open Source Solutions for Earth System Data, OpenGeoHub — 2022
Oxford Machine Learning Summer School, AI for Global Goals — 2022
Science Communication, University of Tübingen — 2022
Leadership in Academia, Industry & Society, University of Tübingen — 2023
Spatial Sampling, Wageningen University & Research — 2021
Uncertainty Propagation in Spatial Modelling, Wageningen University & Research — 2020
Geostatistics, Wageningen University & Research — 2019
GEOSTAT Summer School, OpenGeoHub — 2018
Digital Soil Mapping, ISRIC — 2018
Digital Soil Mapping with R, The University of Sydney — 2012

## Technical Skills

**Programming**
- R — ★★★★☆
- R Markdown — ★★☆☆☆
- Python — ★☆☆☆☆

**Spatial Data Analysis**
- QGIS — ★★★★★
- ArcMap — ★★★★★
- Google Earth Engine — ★★★☆☆

**Statistics**
- JMP — ★★★★★
- SPSS — ★★★★☆
- Minitab — ★★★★☆

**Microsoft Office**
- Word, Excel, PowerPoint — ★★★★★

## Field Work

Soil Sampling, Soil Survey, Geophysical Surveys, Soil Erosion Surveys                                    Iran
Soil Sampling, Soil Survey, Land Evaluation                                                            Kenya
Soil Sampling                                                                                            USA

## Selected Papers

1. **Taghizadeh-Mehrjardi, R.***; Sheikhpour, R.; Zeraatpisheh, M.; Amirian-Chakan, A.; Toomanian, N.; Kerry, R.; Scholten, T. *Semi-Supervised Learning for the Spatial Extrapolation of Soil Information*. Geoderma 2022, 426, 116094, `doi:10.1016/j.geoderma.2022.116094`.

2. **Taghizadeh-Mehrjardi, R.***; Schmidt, K.; Toomanian, N.; Heung, B.; Behrens, T.; Mosavi, A.; S. Band, S.; Amirian-Chakan, A.; Fathabadi, A.; Scholten, T. *Improving the Spatial Prediction of Soil Salinity in Arid Regions Using Wavelet Transformation and Support Vector Regression Models*. Geoderma 2021, 383, 114793, `doi:10.1016/j.geoderma.2020.114793`.

3. **Taghizadeh-Mehrjardi, R.**; Hamzehpour, N.; Hassanzadeh, M.; Heung, B.; Ghebleh Goydaragh, M.; Schmidt, K.; Scholten, T. *Enhancing the Accuracy of Machine Learning Models Using the Super Learner Technique in Digital Soil Mapping*. Geoderma 2021, 399, 115108, `doi:10.1016/j.geoderma.2021.115108`.

4. **Taghizadeh-Mehrjardi, R.***; Mahdianpari, M.; Mohammadimanesh, F.; Behrens, T.; Toomanian, N.; Scholten, T.; Schmidt, K. *Multi-Task Convolutional Neural Networks Outperformed Random Forest for Mapping Soil Particle Size Fractions in Central Iran*. Geoderma 2020, 376, 114552, `doi:10.1016/j.geoderma.2020.114552`.

5. **Taghizadeh-Mehrjardi, R.***; Nabiollahi, K.; Minasny, B.; Triantafilis, J. *Comparing Data Mining Classifiers to Predict Spatial Distribution of USDA-Family Soil Groups in Baneh Region, Iran*. Geoderma 2015, 253–254, 67–77, `doi:10.1016/j.geoderma.2015.04.008`.

All Papers –> Google Scholar🌐 and ResearchGate🌐