

HASAN KHAVARIAN NEHZAK

Associate Professor in Remote Sensing

Department of Physical Geography, Faculty of Social Sciences, University of Mohaghegh Ardabili, Ardabil, Iran

PROFESSIONAL PROFILE

Academic in remote sensing and geographic information systems (GIS), with a PhD in Remote Sensing from the University of Southampton, UK, and university teaching and research experience at the University of Mohaghegh Ardabili since 2015. Research and teaching span optical and thermal remote sensing, satellite-image processing, land-use/land-cover change, GIS-based spatial analysis, radar interferometry, environmental modelling, and geospatial decision support. Experience includes supervising MSc research, contributing to applied research projects, reviewing scholarly manuscripts, and delivering specialist workshops.

RESEARCH INTERESTS

- Optical, thermal and radar remote sensing; satellite data validation and multi-resolution analysis
- Land-use/land-cover mapping, change detection and landscape dynamics
- Land surface temperature, urban heat islands, drought and wildfire monitoring
- SAR interferometry and land-subsidence/landslide monitoring
- GIS, spatial statistics, geospatial modelling and multi-criteria decision analysis
- Remote sensing applications in hydrology, soil and water resources, agriculture and environmental management
- Environmental modelling, cellular automata–Markov models and remote-sensing-supported forecasting

EDUCATION

PhD in Remote Sensing

University of Southampton, Southampton, United Kingdom. Awarded 2012 (2 April 1391, Solar Hijri calendar). Dissertation: “Comparison of multi-angular remote-sensing data from sensors with different spatial resolutions for estimating land-surface albedo.”

MSc in Remote Sensing and Geographic Information Systems (Water and Soil)

Tarbiat Modares University, Tehran, Iran | Awarded 2004 (22 September 1383). Thesis: “Estimation of actual evapotranspiration using MODIS satellite imagery” (study area: Army Model Farm, Golestan Province, Iran).

BSc in Natural Resources Engineering (Range and Watershed Management)

University of Yazd, Yazd, Iran. Awarded 2000 (15 June 1379).

ACADEMIC APPOINTMENT

Associate Professor, 2015–present

University of Mohaghegh Ardabili, Ardabil, Iran.

TEACHING EXPERIENCE

Courses documented in institutional teaching records include undergraduate and postgraduate offerings in remote sensing, GIS, spatial analysis, programming, and environmental applications. Representative courses:

- Principles of Remote Sensing; Applied Remote Sensing; Digital Image Processing; Remote-Sensing Workshop
- Thermal Remote Sensing; Remote Sensing Applications in Geomorphology
- Principles of Geographic Information Systems; Advanced GIS; GIS Workshop; Spatial Analysis with GIS
- Geospatial Technologies: Remote Sensing and GIS; Spatial Analysis; Tourism Spatial Analysis
- Computer Programming Fundamentals; Database Design and Database Management
- GPS Fundamentals; Models and Modelling in Geomorphology
- Remote Sensing Applications in Water and Soil Studies; Water and Soil Management Modelling in GIS
- Statistics and Probability for Geography (documented in teaching records)

RESEARCH THEMES AND SELECTED PROJECTS

Spatial-resolution effects on land-use/land-cover change detection

Research on the role of spatial resolution and object-based satellite-image classification in detecting land-cover transitions; project records include a study focused on Khodabandeh County, Iran.

Remote sensing and hydrological modelling of land-use change

Projects and publications examine land-use change, runoff and monthly streamflow using satellite data and hydrological models in the Kouzeh Teparqi watershed, Ardabil Province.

Multi-criteria geospatial decision support

Applied studies include optimal siting of electric-vehicle charging stations and emergency hospitals using GIS and multi-criteria decision-making methods.

River morphology and environmental change

Research project on temporal river-morphology change using field observations and remote-sensing data, with the Kardeh River near Mashhad as the case study.

Land-surface temperature and urban thermal environments

Supervision and publication activity covers spatial and temporal patterns of land-surface temperature and urban heat islands, including case studies in Tabriz, Tehran, Ardabil, Shiraz and Karaj.

SELECTED PEER-REVIEWED JOURNAL PUBLICATIONS

The following list is compiled from the supplied academic activity record. Persian-language article titles are translated into English for readability; bibliographic details should be checked against the published versions before formal submission.

1. Khavarian, H., Atkinson, P. M., Milton, E. J., & Stewart, J. B. (2013). "Validation of the MODIS reflectance product under UK conditions." *International Journal of Remote Sensing*, 34(20).
2. Khavarian, H., Khodabandehloo, B., & Ghorbani, A. "Object-based classification of satellite images for land-use/land-cover change detection: The Qareh-Su watershed, Ardabil Province." *Remote Sensing and GIS in Natural Resources*. [Persian; year/issue recorded as 1398 / 2019–2020].
3. Hosseini, L., Mohammadi, A., Khavarian Nehzak, H., & Arzhang Mostali Biglou, H. "Spatial distribution of people with disabilities and its relationship with environmental variables: Ahvaz metropolis." *Spatial Planning (Geography)*, 11(1). [Persian; 1400 / 2021–2022].
4. Aghaei, M., Khavarian, H., & Mostafazadeh, R. "Prediction and detection of land-use changes using the CA–Markov model and LCM in the Kouzeh Teparqi watershed, Ardabil Province." *Watershed Management Research (Research and Development)*, 33(128), Autumn 1399 / 2020. [Persian].
5. Khavarian, H., Aghaei, M., & Mostafazadeh, R. "Predicting the effect of land-use changes on monthly streamflow using a hydrological model and remote-sensing data in the Kouzeh Teparqi watershed, Ardabil." *Hydrogeomorphology*, 7(24), 1399 / 2020. [Persian].
6. Izadifard, H., Rath Nezami, S., Mostafazadeh, R., & Khavarian, H. "Urban development and short- and medium-term hydrological drought characteristics in the Samian watershed, Ardabil Province." *Geography and Environmental Studies*, 13(51), 1403 / 2024. [Persian].
7. Maleki, R., Khavarian Nehzak, H., & Asghari Saraskanroud, S. "Measuring land subsidence using radar interferometry: Earthquake-affected areas of western Kermanshah." *Journal of Natural Environmental Hazards*, 12(38), 1402 / 2023. [Persian].
8. Izadifard, H., Rath Nezami, S., Mostafazadeh, R., & Khavarian, H. "Changes in the surface-runoff coefficient associated with land-use/land-cover change in the Samian watershed, Ardabil Province." *Journal of Dryland Geography Studies*, 14(51), 1402 / 2023. [Persian].
9. Rath Nezami, S., Izadifard, H., Khavarian, H., & Mostafazadeh, R. "Land-use/land-cover changes in the Samian watershed and their relationship with surface-water quality." *Environment and Water Engineering*, 9(3), 1402 / 2023. [Persian].
10. Sharifnejad, T., Khavarian Nehzak, H., & Veramash, S. "Assessment of the MODIS active-fire product for fire detection in Golestan Province." *Journal of Natural Environmental Hazards*, 10(30), 1400 / 2021. [Persian].
11. Asghari Saraskanroud, S., Pasandeh, A., & Khavarian Nehzak, H. "Land-use changes during 2013–2024 using Landsat 8 imagery and assessment of their impacts: Miandoab city." *Studies in Urban and Regional Sustainable Development*, 5(4), 1403 / 2024. [Persian].
12. Nikfal Maghanloo, S., & Khavarian, H. "Locating electric-vehicle charging stations: A case study of Ardabil city." *Journal of Environmental Science Studies*, 10(1), 1404 / 2025. [Persian].
13. Khavarian Nehzak, H. "Using optical remote sensing to identify oil slicks." *Oil and Gas Exploration and Production Monthly*, issue 176, 1399 / 2020. [Persian].
14. Aghaei, M., Khavarian, H., & Mostafazadeh, R. "Assessment of soil salinity changes in agricultural lands of Bonab County using satellite and ground data." *Iranian Journal of Remote Sensing and GIS*. Online / in press, 1403 / 2024. [Persian].
15. Khavarian, H., Salmanzadeh, F., Mohammadi, A., & Jafarzadeh, J. "Evaluating and comparing land-surface-temperature algorithms using Landsat imagery and linear regression: Tabriz city." *Remote Sensing and GIS in Natural Resources*. In press, 1404 / 2025. [Persian].

16. Khavarian, H., & Fekrat, H. "Geospatial suitability assessment for emergency hospitals in Tehran using multi-criteria decision-making methods." *Remote Sensing and GIS in Natural Resources*. In press, 1404 / 2025. [Persian].
17. Aghaei, M., Mostafazadeh, R., Khavarian Nehzak, H., & Hussain, S. (2025). "Geo-spatial land-use change dynamic assessment in consecutive periods under the agricultural expansion driving force." *Agriculture and Forestry*, 71(1).

RESEARCH SUPERVISION

Institutional records document supervision or co-supervision of 37 MSc dissertations at the University of Mohaghegh Ardabili. Topics include remote sensing and GIS, land-use/land-cover change, thermal remote sensing, drought and wildfire monitoring, radar interferometry, soil salinity, urban growth, hydrological modelling and geospatial site selection.

Selected supervised/co-supervised dissertation topics:

- Assessment of drought in Zanjan Province using MODIS imagery and meteorological data.
- Effects of alternative land-use scenarios on flooding in the Kouzeh Tepraqi watershed, Ardabil.
- Physical expansion of Qayen city assessed using smart-growth indicators and remote sensing.
- Spatial and temporal effects of urban green space on heat-island distribution in Shiraz.
- Detection of fire-affected areas and accuracy assessment of MODIS fire products.
- Modelling agricultural land-use change over two decades in the Qareh-Su watershed, Ardabil.
- Monitoring landslides using differential interferometric SAR.
- Relationship between land-surface temperature and land use using Moran's spatial autocorrelation.
- Remote-sensing assessment of soil salinity around Lake Urmia.
- Land-use change and its effects on groundwater quantity and quality.
- Mapping rice-growing areas using satellite imagery and machine-learning classification algorithms.
- Measurement of land subsidence using radar interferometry in earthquake-affected western Kermanshah.
- Spatiotemporal changes in saffron cultivation using remote sensing and GIS.
- Spatiotemporal variability of urban heat islands in Tabriz.
- Feasibility of solar panels for rural energy supply using satellite imagery and the SEBAL algorithm.
- Identification of suitable ecotourism areas using remote sensing and GIS in Namin County.
- Urban land use and heat islands in Tehran using remote sensing and GIS.
- Spatiotemporal changes in land-surface temperature in Ardabil County.

SCHOLARLY SERVICE

- Peer review of manuscripts for Geography and Development and Rural Research and Planning (Ferdowsi University of Mashhad), including studies on cellular automata–Markov urban change, rural housing satisfaction and GIS-based landfill suitability.
- Academic reviewing documented in the institutional record: at least three manuscript assessments.
- Research-project participation/leadership recorded for applied studies on object-based land-cover classification, river morphology and electric-vehicle charging-station siting.

WORKSHOPS AND PROFESSIONAL TRAINING

- Instructor, "Remote Sensing and Geographic Information Systems: Concepts, Analysis and Applications Across Disciplines," Faculty of Social Sciences, 2018.
- Instructor, "Fuzzy Computation in Environmental Modelling," Faculty of Social Sciences, 2018.
- Instructor, "Markov Chains in Environmental Modelling," Faculty of Social Sciences, 2018.
- Instructor, "Cellular Automata in Environmental Modelling," Faculty of Social Sciences, 2018.

CONFERENCE PARTICIPATION

The supplied record includes participation/presentation entries at national and international meetings on geospatial information science, natural hazards and environmental crises, natural-resource conservation, dryland agriculture and water management, earth sciences, and urban development. Conference records include events hosted by the University of Mohaghegh Ardabili, Ferdowsi University of Mashhad, University of Zanjan, and other Iranian academic institutions.

TECHNICAL AND METHODOLOGICAL EXPERTISE

- Satellite image analysis and validation; MODIS and Landsat data
- GIS-based spatial analysis, site selection and multi-criteria decision analysis (AHP, ANP and related methods)
- Land-use/land-cover classification and change modelling (object-based methods, CA–Markov, LCM)
- Thermal remote sensing and land-surface-temperature analysis

- Radar interferometry for land subsidence and landslide monitoring
- Remote sensing integration with hydrological and environmental models
- Geospatial database design and management; introductory programming for GIS applications

REFERENCES

Available upon request.