Mahdi Farmahini Farahani **(Arad)** **Undergraduate Student**
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EDUCATION

University of Tehran, Institute of Geophysics Tehran, Iran
Master of Science, Geophysics (Exploration Seismology) *2025 – 2027*

Kharazmi University, Faculty of Earth Sciences Tehran, Iran
Bachelor of Science, Geology *2021 – 2025*

- Chairperson, Geological Society of Kharazmi University (June 2024 – June 2025)
- Vice President of Media, Geological Society of Kharazmi University (November 2023 – June 2024)
- Ranked 8th out of 60 students in the Undergraduate Studies

University of Lille, International Academy Lille Hdf Lille, France
Water Resource Management (Hydro 2024) Summer School *Summer 2024*

- Completed 5 ECTS credits in water resource management topics.
- Presented an oral defense on numerical groundwater modeling, focusing on changing water abstraction in the Weyib Watershed, Ethiopia.

TEACHING EXPERIENCE

Kharazmi University Tehran, Iran
Programming Teaching Assistant *April 2025 – June 2025*

- Programming Course, under supervision of Dr. Morteza Asemani

Kharazmi University Tehran, Iran
Geostatistics Teaching Assistant *February 2025 – June 2025*

- Geostatistics Course, under supervision of Dr. Ehsan Pegah

Young Scholars Club Tehran, Iran
Instructor *July 2024*

- Taught "Applied Data Science in Geology" for the Iran National IESO[1] 2024 Team

Kharazmi University Tehran, Iran
Instructor *April 2024 – June 2024*

- Organized and instructed the Advanced Python and Machine Learning Workshop

NODET[2] Tehran, Iran
Teacher *May 2021 – September 2021*

- Taught ITEO[3] Marketing at Allameh Helli (Branches 5 & 8) and Farzanegan High Schools

WORK EXPERIENCE

FEZtool Tehran, Iran
Co-Founder & Research and Development Specialist *August 2023 – Present*

- Led Earth science research initiatives, developing advanced algorithms and conducting geospatial data analysis for scientific insights.

International Astronomical Search Collaboration, NASA Partner Remote
Asteroid Search Team Member *July 2025 – September 2025*

- Contributed to the Astronomy Enthusiasts of Iran 5 & 3 team in analyzing Pan-STARRS data, earning credit for 3 preliminary asteroid discoveries (Object IDs: P22c6kw, P12cZ6o and P12dtv1).

Kharazmi University Tehran, Iran
Research Assistant *October 2024 – January 2025*

- Performed MASW to extract dispersion images under supervision of Dr. Mehdi Talkhablou.

ARYANIC Tehran, Iran
Project Manager *November 2022 – June 2023*

- Managed a project titled "Business Factory", leading a team of 7

GreenOly Tehran, Iran
Product Manager *August 2022 – January 2023*

- Created an Entrepreneurship MOOC with over 15 Olympiad Medalists.

[1] International Earth Science Olympiad
[2] National Organization for Development of Exceptional Talents
[3] Iranian Thinking & Entrepreneurship Olympiad

COMMUNITY SERVICE

The 4th National Festival of Young Iranian Geologists — Tehran, Iran
Education Committee Member — *June 2025 – July 2025*

The 3rd National Festival of Young Iranian Geologists — Tehran, Iran
Graphics Committee Member — *May 2024 – June 2024*

Imam Khomeini International University — Qazvin, Iran
Editorial Board Member — *September 2023 – June 2024*

SELECTED PUBLICATIONS

Journal Articles

1. Talkhablou, M., **Farmahini Farahani, M.**, & Mansouri, S. S. (2025). A Python-Based Framework for Land Cover Classification in Engineering Geology: A Comparative Assessment of SVM, K-Means, and Spectral Indices. ***Kharazmi Journal of Earth Sciences.*** (In Press)
2. **Farmahini Farahani, M.** (2024). Designing the green belt in the southwest of Zahedan. ***Ovan Scientific Journal***
3. Saravani, M. J., Kashef, S., **Farmahini Farahani, M.**, Kashefi, M., & Zohreh, M. (2023). Investigating the accuracy of hybrid models with wavelet transform in the forecast of watershed runoff. ***Journal of Water Management Modeling (JWMM)***

Conference Papers

1. **Farmahini Farahani, M.** (2025, August). Machine Learning-Enhanced Seismic Event Detection and Noise Reduction for Planetary Seismology: Insights from Mars and Lunar Data. In ***Seismology Student Workshop (SSW 2025)***, GatherTown (Virtual)
2. Rezaei, K., & **Farmahini Farahani, M.** (2024, March). Visualization of magnetometric data with Python (case study: Segregation sedimentary units of Torud Playa). In ***The 1st Conference on Applied Geophysics in Mines***, Tehran, Iran
3. Rezaei, K., & **Farmahini Farahani, M.** (2024, February). Comparing the performance of the k-means clustering method and spectral indices in characterizing land use and land cover using remote sensing with Python (case study: Landsat 8 multi-spectral images). In ***2nd International Conference for Iranian Geography and Earth Sciences Students***, Tehran, Iran
4. **Farmahini Farahani, M.**, Rezaei, K., Karamollahi, S., & Moghadam, F. J. (2024, January). Application of PCA algorithm in remote sensing using Python programming language (case study: Landsat 9 multispectral images). In ***8th Symposium of Sedimentological Society of Iran***, Hormozgan, Iran
5. Rezaei, K., & **Farmahini Farahani, M.** (2023, September). The importance of using Python programming language in Earth science. In ***26th Conference of Geological Society of Iran***, Urmia, Iran

Books

1. **Farmahini Farahani, M.**, Najibifar, Y., & Akbarzadeh Afshari, A. (2025). *Earthquake Prediction Using Geophysical Data Analysis and Artificial Intelligence.* **Heritage Branch, Library and Archives Canada**
2. Rezaei, K., **Farmahini Farahani, M.**, Karimzadehasl, E. (Trans.). (2024). *Introduction to Python in Earth science data analysis: From descriptive statistics to machine learning.* **Tasir Publication.** (Original work published by Maurizio Petrelli)

PROJECTS

PlanetaryGeophysics | `github.com/aradfarahani/PlanetaryGeophysics` — *2025 – Present*

- Built an open-source Python platform for analyzing and visualizing planetary geophysical data.
- Created a 3D interactive Mars globe and mapped gravity, seismic, and magnetic data.

FEZrs (Open Source) | `pypi.org/project/fezrs` — *2023 – Present*

- Advanced Python library for remote sensing, developed by FEZtool with over 80,000 downloads

Seismicity Analysis in Iran (2010–2025) | iris.edu/hq/workshops/2025/06 — *2025*

- performed Iran seismicity analysis for the *Seismology Skill-Building Workshop 2025* final project.

Geoelectricspy (Open Source) | `github.com/aradfarahani/Geoelectricspy` — *2023*

- Interactive 3D visualization tool for subsurface resistivity using geoelectrics survey data

LICENSES & CERTIFICATIONS

Seismology Skill Building Workshop 2025, EarthScope Consortium *2025*

The Science of the Solar System, California Institute of Technology (Offered by Coursera)

AstroTech, The University of Edinburgh (Offered by Coursera)

Space Exploration, Technical University of Munich (Offered by Coursera)

Rocket Science for Everyone, Yale University (Offered by Coursera)

International Data Masterclass, United Nations Big Data *2024*

Application of Remote Sensing in Geology, Zawinas

Investigating practical issues in the exploration of Sulphide Deposits using the IP-RS method, (NIGS)[1]

Global Environmental Management, DTU[2] (Offered by Coursera) *2023*

The 2nd Summer School of Geology, University of Tabriz

Remote Pilot Certification (Multirotor), CAAIRI[3]

Unmanned Aerial Vehicle Surveying, Maan Academy

GIS, Mapping, and Spatial Analysis Specialization, University of Toronto (Offered by Coursera)

Hydraulic Modeling of flood plains in Urban Rivers, Kharazmi University *2022*

CS50 Certificate, CS50 (Harvard Uiversity) *2021*

HONORS & AWARDS

LeetCode Global Ranking - *Ranked Top 100*, LeetCode *2025*

Deep-ML Global Leaderboard - *Ranked Top 50*, Deep-ML.com

Master's Entrance Exam (Geophysics) - *Ranked 8th Nationwide*

Hydro 2024 Research-Oriented Summer School - *Full Scholarship*, University of Lille *2024*

Geological Society Logo Design Contest - *Winner*, Kharazmi University

Research Visit Grant (2500 DKK) - *Awardee*, University of Copenhagen *2022*

DrCT 2021 Global Computational Competition - *Gold Medalist* *2021*

1st national Thinking & Entrepreneurship Olympiad (ITEO) - *Silver Medalist* *2020*

WMI 2015 World Mathematical Championships Selection - *Silver Medalist* *2015*

SKILLS & INTERESTS

Programming Languages: Python (ObsPy, pyGIMLi, Astropy, OpenCV, TensorFlow, PyGMT, Xarray, Scikit-learn, kepler.gl, Leafmap, Folium, Rasterio, GeoPandas), Julia, Bash (Shell scripting), SQL (MySQL), GMT, GDAL; Familiar with R

Markup Languages: Markdown, LaTeX

Softwares: Astrometrica, ENVI, Global Mapper, ArcGIS, QGIS, Agisoft Metashape, Blender, 3ds Max, Google Earth Pro, Datamine, SAS.Planet, CorelDRAW, Groundwater Vistas

Field Techniques: Drone Surveying, Geoelectrical Methods (Induced Polarization–Resistivity Sounding, IP-RS)

Languages: Farsi (Persian): *Native*; English: *Fluent (C1)*

Research Interests: Signal Processing, Applied Geophysics, Remote Sensing, Planetary Science, Machine Learning, Image Processing, Open-Source Software Development, Inverse Problems

PROFESSIONAL MEMBERSHIPS

Space Generation Advisory Council Member, 2025 – Present

Google Maps Platform Innovators Member, 2025 – Present

Geological Society of Iran Student member, 2021 – 2022

[1] National Iranian Geophysical Society
[2] Technical University of Denmark
[3] Civil Aviation Authority of Islamic Republic of Iran