

Pouria Karami



Research Interest

My research interests focus on understanding planetary surface processes through multi-sensor remote sensing, drone-based mapping, image processing, and laboratory work. I am also interested in applying machine learning and autonomous systems to planetary exploration and scientific data collection.



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WORK EXPERIENCES

Student Assistant

Natural History Museum, Berlin, Germany Project: NoSHADE

PI: Dr. Jenny Feige

November 2024 – present

- Conducting drone imaging
- Performing AI object detection in drone-imagery
- Carrying out field work at the Atacama Desert
- Creating 3D models of the terrain surface

Student Assistant

Working Group: Applied and Earthquake Seismology, FU-Berlin
Project: SLIRP2024

PI: Dr. Jonas Folesky

October 2024 – present

- Analyzing seismic activities at the Atacama Desert

Internship

Natural History Museum, Berlin, Germany
Project: NoSHADE

PI: Dr. Jenny Feige

August 2024 – November 2024

- Conducted sedimentology-based sampling and analysis
- Performed deep learning analysis of Atacama Desert samples

Researcher and Designer

Asare Simorgh Madakto Corporation, Ilam, Iran
December 2017 – October 2023

- Engaged as an active member of the R&D team in innovative projects
- Led the product development process from concept to prototype
- Completed two major projects successfully
- Collaborated closely with cross-functional teams
- Promoted creativity and a culture of excellence

EDUCATION

M.Sc. Planetary Science and Space Exploration

Freie Universität Berlin, Germany

October 2023 – present

- Expected Graduation: 2026

B.Sc. Aerospace Engineering

Islamic Azad University, Najafabad Branch, Iran

September 2012 – February 2017

Master's Thesis Project

Natural History Museum, Berlin, Germany

Project: NoSHADE

Supervisor: Prof. Dr. Kai Wünemann

Co-Supervisor: Jenny Feige

Title: AI-based automated boulder and polygon network detection for deciphering planetary sedimentary processes

Project Plan: Studying boulder movement in the hyper arid Atacama desert and the surface processes behind the transportation. Hundreds of thousands of boulders were mapped and characterized using high resolution drone imagery and ML based segmentation. Their spatial distribution, orientation, and the terrain are analyzed to identify movement patterns and better understand the processes shaping the desert surface that are potentially common on other planets and moons, such as Mars.

Research Experience

- Designed and implemented drone-based systems for transporting medical and biological materials across urban areas
- Developed unmanned aerial and submarine robot
- Built automated systems for handling and transferring biological samples in laboratory settings
- Designed and built small-scale rescue drones
- Designed and evaluated solar-powered UAV systems with a focus on energy efficiency
- Performed energy and efficiency (exergy) analysis of hybrid propulsion systems
- Developed an AI-powered boulder detection system using drone imagery (SAM + custom ML models)
- Executed a two-month field project involving drone mapping, environmental sampling, and seismic monitoring in desert conditions

Research Associate

Ilam Science and Technology Park, Ilam, Iran
May 2017 – October 2023

- Acted as a consultant and inventor, providing expertise and innovative solutions
- Contributed to technological and research advancement
- Collaborated with team members to drive projects forward

Designer

Islamic Azad University, Najafabad Branch, Iran
September 2014 – January 2017

- Contributed to the R&D team's design and development of essential wind tunnel components
- Collaborated on conceptualization, engineering, and CATIA V5 modeling

Skills

Programming Language

Python, Fortran, MATLAB

Machine Learning

TensorFlow, PyTorch, CUDA

Data Science

Pandas, NumPy, GeoPandas, SciPy

GIS & Georeferencing

QGIS, ArcGIS, GNSS, Agisoft Metashape

Remote Sensing

UAV Imaging, Thermal Imaging, Terrestrial Imaging

Field & Analytical Methods

XRF, Geological Sampling, Drilling, Time-lapse Monitoring

Engineering

CATIA, AutoCAD, ANSYS Fluent, Arduino, Engineering Equation Solver (EES), SolidWorks, AAA, Gas Turb

EU Remote Pilot Competency Certificate (A1/A3)

Training and examination through the German Federal Aviation Office (LBA)

Languages

Persian:	Native
English:	Upper-Intermediate to Advanced
German:	Intermediate

Soft Skills

- Analytical thinking and problem-solving
- Strong communication and active listening
- Teamwork and collaboration
- Adaptability and resilience
- Time management and organization
- Attention to detail
- Initiative and self-motivation
- Leadership and coordination
- Critical thinking
- Reliability and accountability

Publication

- Pouria Karami, Alessandro Airo, Christof Sager, Jenny Feige. (2026, March, 16-18). Detecting and Monitoring Boulder Movement Using Segmentation-Based Deep Learning. DGP2026, Berlin, Germany, https://www.planet-dgp.de/conferences/DGP2026/abstract_show.php?id=87a

Patents

- Karami, Pouria. Soleimaniandehaghani, Marzieh. 2021. Vertical flying robot with the ability to move underwater. I.R.I Patent 105079, filed October 22, 2020, and issued August 29, 2021.
- Karami, Pouria. Soleimaniandehaghani, Marzieh. Karami, Payam. Hosseinipouya, Seyedali. 2021. Flying drone to transfer organs, blood, biological and blood products intercity. I.R.I Patent 103932, filed December 06, 2020, and issued March 06, 2021.
- Karami, Pouria. Hosseinipouya, Seyedali. Karami, Ahmadreza. 2020. Flying robot to transfer organs and biological products within the city. I.R.I Patent 101633, filed January 22, 2020, and issued July 11, 2020.
- Panahiesfandarani, Mohammadreza. Karami, Pouria. 2017. Laboratory sample transfer device. I.R.I Patent 93573, filed November 26, 2016, and issued September 17, 2017.

Honors and Achievements

- Awarded 3rd Place in the Dot RINEX Idea Show, Iranian Space Agency, Tehran, Iran - May 30, 2020 (Field: Navigation and Positioning Systems)
- Participated in the Exhibition of Achievements of Knowledge-Based Companies in Combating Smuggling, Iran National Innovation Fund, Tehran, Iran - November 24 - 26, 2019
- Participated in the Exhibition of Knowledge-Based and Technological Products, Ilam Science and Technology Park, Ilam, Iran - January 30, 2019
- Participated in the 19th Exhibition of Research, Technology, and Market Achievements, Tehran, Iran - December 24 - 27, 2018
- Awarded Joint 2nd Place in the Startup League, 9th National Aerospace Competitions, Amirkabir University of Technology, Tehran, Iran - May 3 -13, 2017
- Awarded 2nd Place in Conceptual Design, 1st National Aerospace Competition, Payame Noor University of Khorasan Razavi, Mashhad, Iran - September 29, 2016
- Awarded 2nd Place in Rescue Structure, 2nd Earth Gravity Challenge Tournament, Najafabad, Isfahan, Iran - December 23, 2015
- Ranked in the top 15% in the Non-Medical National Entrance Examination (Aerospace Engineering), Islamic Azad University - 2012

Volunteering

- Contributed to conference planning and organization, Europlanet Early Career Network
 - Berlin, Germany — 2024
 - Helsinki, Finland — 2025

(Supported early-career scientific events, networking activities, and program coordination)

Membership

- Deutsche Gesellschaft für Planetenforschung (DGP)
- Europlanet Early Career Network (EPEC)

References

Available Upon Request