Maryam Torkashvand
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Education

Ph.D., Geography - Geographic Information Science and Cartography   **2027 (Expected)**
University of Iowa, Iowa City, IA, USA.
- Thesis: Spatial-Social Network Analysis for studying migration and the evolution of kinship networks.

Interdisciplinary Graduate Certificate in Informatics   **2025 (Expected)**
University of Iowa, Iowa City, IA, USA.

M.Sc., Remote Sensing and Geographic Information Systems - Satellite Meteorology   **2020**
Science and Research Branch, Islamic Azad University, Tehran, Iran.
- Thesis: A new framework for risk assessment of groundwater pollution.

B.E., Surveying Engineering   **2014**
Shahid Rajaee Teacher Training University, Tehran, Iran.

Experience

Research Assistant   **May 2023 – Present**
Department of Geographical and Sustainability Sciences, The University of Iowa, IA, USA.

- Developed an analytical workflow to geocode and map individuals' birthplaces from crowd-sourced family trees spanning over three centuries (NSF-funded project).
- Extracted migration patterns using network analysis and mapped spatial-social networks of over 30 million individuals.
- Developed a web map of U.S. migration structures and conducted usability testing to evaluate user experience and functionality.

Research Associate (Summer Job)   **May 2024 – August 2024**
IIHR—Hydroscience & Engineering, The University of Iowa, IA, USA.

- Created "[Rivers and Risks](#)" story map using ArcGIS Pro, online, and srvey123. (NSF-funded project)
- Mapped nitrate/nitrite pollution and social vulnerability to correlate socioeconomic status with pollution exposure risk at various scales.
- Developed an animated map of Iowa state population growth and transportation developments from 1850 to 2020.

Teaching Assistant   **Aug 2022 – May 2023**
Department of Geographical and Sustainability Sciences, The University of Iowa, IA, USA.

- Instructed two hands-on laboratory classes on GIS, mentoring students in ArcGIS Pro applications.

Flight Attendant   **2015 – 2022**
Mahan Airlines, Tehran, Iran.

- Developed strong teamwork, time management, and leadership skills through managing inflight operations.

GIS Expert   **2014 – 2015**
RassadIran Surveying Company, Tehran, Iran.

- Contributed to cadastral map development using ArcGIS for Tehran.

- Evaluated elevation errors in road construction surveying projects.

Publications

Manuscripts in Review and Preparation

Koylu, C., **Torkashvand, M.**, Kasakoff, A. B. (Accepted) Evaluation of the child ladder method for studying migration using family trees: A comparison with linked US census data, 1850 to 1920. *Historical Methods Journal*.

Torkashvand, M., Koylu, C., Chan, C. H., Kasakoff, A. B. (Under review) Geocoding Birthplaces in Crowd-sourced Family Trees: Temporal Toponym Resolution with Hierarchical Paths and a Human-in-the-Loop Large Language Model. *International Journal of Geographic Information Science.*

Torkashvand, M., Koylu, C., Kasakoff, A. B. (In preparation) The evolution of U.S. migration regions from 1789 to 1930 using a population-scale family tree dataset. *AAG Annals Journal.*

Koylu, C., **Torkashvand, M.,** Kasakoff, A. B. (In preparation) Changing migration within the United States during the settlement process: the role of family size. *Family History.*

Peer-Reviewed Journal Articles

Torkashvand, M., Neshat A, Javadi S, Yousefi H, Berndtsson R. (2023) Groundwater Vulnerability to Nitrate Contamination from Fertilizers Using Modified DRASTIC Frameworks. *Water*, 15(17):3134. https://doi.org/10.3390/w15173134.

Torkashvand, M., Neshat, A., Javadi, S., Pradhan, B. (2021) New hybrid evolutionary algorithm for optimizing index-based groundwater vulnerability assessment method. *Journal of Hydrology*, 598, 126446. https://doi.org/10.1016/j.jhydrol.2021.126446.

Torkashvand, M., Neshat, A., Javadi, S., Yousefi, H. (2020) DRASTIC framework improvement using Step-wise Weight Assessment Ratio Analysis (SWARA) and combination of Genetic Algorithm and Entropy. *Environmental Science and Pollution Research*. https://doi.org/10.1007/s11356-020-11406-7.

Peer-Reviewed Conference Proceedings

Torkashvand, M. & Koylu, C. (2024). A Hierarchical Approach for Geocoding Birthplaces in Temporally Continuous Crowd-Sourced Family Tree Data. CAGIS+ UCGIS Symposium, June 3, 2024, Columbus, OH, USA.

Koylu, C. & **Torkashvand, M.** (2023) The effect of disruptive events on spatial and social interactions: An assessment of structural changes in pre-and post-COVID-19 pandemic networks. GIScience 2023 Workshop on Disruptive Movement Analysis (DMA'23), September 12, 2023, Leeds, United Kingdom. https://doi.org/10.48550/arXiv.2311.01559.

Koylu, C., **Torkashvand, M.**, Kwon, H., Kasakoff, A. B. (2022) Mapping migration regions and their evolution from population-scale family trees: What can they tell us about cultural identities and regions today? In 6th ACM SIGSPATIAL Workshop on Geospatial Humanities (GeoHumanities'22), November 1, 2022, Seattle, WA, USA. https://doi.org/10.1145/3557919.3565814.

Torkashvand, M., Neshat A., Javadi S., Yousefi H. (2021) Improvement of GIS-Based DRASTIC Model Using Step-Wise Weight Assessment Ratio Analysis (SWARA) and Two New Hybrid Frameworks (Iran). In: Ksibi M. et al. (eds) Recent Advances in Environmental Science from the Euro-Mediterranean and Surrounding Regions (2nd Edition). EMCEI 2019. Environmental Science and Engineering. Springer, Cham. https://doi.org/10.1007/978-3-030-51210-1_283.

Leadership & Involvement

GIS Lab Representative   **August 2024 – Present**
Geography Department Graduate Student Organization, University of Iowa
- Acted as a liaison between the GIS Lab and the Graduate Student Organization, advocating for student needs.

Mentor   **Summer 2023, Summer 2024**
Secondary Student Training Program (SSTP), University of Iowa
- Mentored a team of high school students in a summer program to be involved in real-world research projects.

Student Leadership Trainer   **August 2024**
Graduate Student Orientation, University of Iowa
- Led orientation sessions for incoming international graduate students.

Participant   **Spring 2024**
Bridging Domestic and Global Diversity Certification, University of Iowa
- Completed leadership and cultural competency training.

Guest Lecturer   **Fall 2023**
GEOG 2050: Foundations of GIS, University of Iowa
- Delivered lectures on data classification methods with a focus on theoretical aspects.

Conference Presentations

Torkashvand, M. & Koylu, C. (June 2024). A Hierarchical Approach for Geocoding Birthplaces in Temporally Continuous Crowd-Sourced Family Tree Data. CAGIS+ UCGIS Symposium 2024, Ohio State University, Columbus, OH.

Brandt, K., **Torkashvand, M.**, Xu, J. (March 2024). Spatiotemporal Dynamics of a Meta-Coupled World. IGUIDE Virtual Center (Invited Speaker).

Torkashvand, M., Koylu, C. & Kasakoff, A.B. (November 2023). US migration from 1850 to 1920: A comparison of family trees with linked census data. 49th Annual Meeting of the Social Science History Association, 2023. Washington, DC.

Koylu, C. & **Torkashvand, M.** (September 2023). The effect of disruptive events on spatial and social interactions: An assessment of structural changes in pre-and post-COVID-19 pandemic networks. GIScience 2023 Workshop on Disruptive Movement Analysis (DMA'23), Leeds, United Kingdom.

Torkashvand, M. & Koylu, C. (June 2023). Identifying the changes in the structure of human communication and mobility networks in response to COVID-19. UCGIS Symposium 2023, Yale University, New Haven, CT.

Torkashvand, M. & Koylu, C. (May 2023). Patterns of the past: a study on historical migration network structures. 2023 Spatial Social Network (SSN) Workshop. Atlanta, GA.

Torkashvand, M., Koylu, C., Kwon, H. & Kasakoff, A.B. (March 2023). Historical Migration Regions and Present Regional Identities. 2023 AAG Annual Meeting, Denver, CO.

Koylu, C., **Torkashvand, M**., Kwon, H. & Kasakoff, A.B. (November 2022). Mapping migration regions and their evolution from population-scale family trees: What can they tell us about cultural identities and regions today? 6th ACM SIGSPATIAL International Workshop on Geospatial Humanities, Seattle, WA.

Torkashvand, M., Neshat, A., Javadi, S., Yousefi, H. (September 2019). An improved DRASTIC-based groundwater vulnerability assessment using particle swarm optimization (PSO) algorithm. Proceedings of IAH2019, the 46th Annual Congress of the International Association of Hydrogeologists, Málaga, Spain.

Honors & Awards

- Best Student Paper Award, CaGIS + UCGIS Symposium - $150 (June 2024).
- Regional Cartographic Conference Scholarship - $200 (June 2024).
- I-GUIDE Summer School, UCAR, Boulder, Colorado. Participated in a selective week-long immersive program for geospatial data science using cloud- and high-performance computing. Contributed to the completion of a team-based project on "Spatiotemporal *dynamics of a meta-coupled world*." (August 2023).
- Spatial Social Network Workshop grant, the Georgia Institute of Technology - $400 (May 2023).
- Travel grant. Graduate College, the University of Iowa - $500 (March 2023).
- Travel grant. ACM SIGSPATIAL executive committee - $1000 (November 2022).
- Ranked 1st among M.Sc. students in RS & GIS. Class of 2020, Islamic Azad University (Fall 2017, Spring 2018).
- Ranked 6th in the Islamic Azad University Entrance Exam for Master studies (2017).

SKILLS

Programming & Software:

Python, R, ArcGIS (Pro, Online, StoryMaps, Survey123), QGIS, PostGIS & PostgreSQL, HTML & CSS & JavaScript, D3.js, SPSS.

Analytical and Technical Skills:

Spatial Data Analysis and Visualization, GIS-based Modeling, Database Management, Big Data Analysis, Network Analysis, AI Intuition, Spatial-Social Network Analysis, Multi-Criteria Decision Making, Vulnerability Assessment, Web Mapping.