MORTEZA KARIMZADEH
ASSISTANT PROFESSOR OF GEOGRAPHY
UNIVERSITY OF COLORADO BOULDER

CURRICULUM VITAE
February 24, 2025

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EDUCATION

- <u>Doctor of Philosophy</u>, Geography (Geographic Information Science),
  Penn State, USA, May 2018
  Adviser: Dr. Alan MacEachren
  Dissertation: *Geo-Annotation and Geoparsing of Textual Documents*
- <u>Master of Science</u>, Geographic Information Systems Engineering,
  K.N. Toosi University of Technology, Tehran, Iran, Sept. 2011
  Thesis: *Implementation of an Interoperable Geoprocessing Service using OGC and W3C Specifications*
- <u>Bachelor of Science</u>, Surveying (Geomatics) Engineering,
  Shahid Rajaee Teacher Training University (SRTTU), Tehran, Iran, Sept. 2008
  Undergraduate thesis: *Image Enhancement Techniques for Remote Sensing: A Review*

RESEARCH INTERESTS

- Spatiotemporal Machine Learning
- Geospatial Data Science
- Remote Sensing
- Visual Analytics

APPOINTMENTS AND AFFILIATIONS

- **Faculty Fellow,** Institute of Behavioral Science, University of Colorado Boulder, May. 2022 – present.
- **Affiliate Faculty,** CU Population Center, University of Colorado Boulder, Feb. 2021 – present.
- **Affiliate Assistant Professor,** Department of Computer Science, University of Colorado Boulder, Aug. 2020–present.
- **Affiliate Assistant Professor,** Department of Information Science, University of Colorado Boulder, Jun. 2020–present.
- **Assistant Professor,** Department of Geography, University of Colorado Boulder, Aug. 2019–present.

- **Postdoctoral Researcher**, Purdue University Visual Analytics Center (Director: Prof. David Ebert), Department of Electrical and Computer Engineering, Purdue University, July 2018–Aug. 2019.
  - Responsibilities: Assisting in grant proposal writing, mentoring graduate and undergraduate students for research, conduct research in visual analytics in the two general areas of sustainable viticulture and situational awareness for crisis response.
- **Spatial Data Scientist | GIS Developer**, 3SG+, Columbus, Ohio, May 2018–July 2018.
  - Responsibilities: GIS Project Management, full-stack development.
- **Lecturer in GIScience***, Department of Geography, Ohio State University, Aug. 2017–Aug. 2018.
  - Responsibilities: *Spatial Analysis (spatial statistics - senior/graduate level), and GeoVisualization (senior/graduate level)*,
- **Research/Teaching Assistant**, Department of Geography/Department of Information Sciences and Technology/Institute for Natural Gas Research (INGaR)/John A. Dutton e-Education Institute MGIS program, Pennsylvania State University, Aug. 2012–Jun. 2017
  - Responsibilities: *Teaching Assistant (Dynamic Cartographic Representation), Online Course Developer (Open Web Mapping), Instructor (GIS), Research Assistant, Developer (notably GeoAnnotator, and GeoTxt, a web API for geoparsing text, API available at http://geotxt.org/).*
- **GIS Manager/Engineer**, Sepehr Geomatics Engineering Co., Tehran, Iran, Aug. 2010–May 2012.
  - Responsibilities: GIS desktop development, Microsoft SQL Server and ArcSDE-based enterprise geodatabase design (logical and physical modelling) and implementation, ArcObjects customization and ArcGIS Server/client service support.
- **Land Surveying Engineer**, Bonyan Naghsheh Negar Consulting Engineers Co., Tehran, Iran, Oct. 2007–Aug. 2008.
  - Responsibilities: Collecting and post-processing differential GPS observations, geodetic network statistical adjustment, spatial feature collection, construction positioning execution (Kinetic GPS and total-stations theodolite – AutoCAD Civil 3D, MicroStation).

HONORS, AND AWARDS

- International Cartographic Association Scholarship, Aug. 2023 ($600)
- Course Development Grant for the course Advanced Geovisualization and Web Mapping, New Assistant Professor Program, University of Colorado Boulder, Apr. 2020 ($4000).
- Doctor of Philosophy Paper E. Willard Miller Award in Geography 2017, 2nd place, Penn State, Apr. 2017 ($400).
- Cartographic E. Willard Miler Award in Geography 2016, 1st place best cartographic/software entry, Department of Geography, Penn State, Apr 2016 ($600).
- USGIF Doctoral Scholarship, *The United States Geospatial Intelligence Foundation*, 2015 ($5K).
- Doctor of Philosophy Paper E. Willard Miller Award in Geography 2014, 2nd place, Penn State, Apr. 2014 ($400).

Peer-reviewed Journal Articles

- Wang, Z. [*], Crooks, J. L., Regan, E. A., & **Karimzadeh, M.** (2025). High-Resolution Estimation of Daily PM2.5 Levels in the Contiguous US Using Bi-LSTM with Attention. *Remote Sensing, 17*(1). https://doi.org/10.3390/rs17010126

- Vahedi, B. [*], Lucas, B. [Ω], Banaei-Kashani, F., Barrett, A. P., Meier, W. N., Khalsa, S. J. S., & **Karimzadeh, M.** (2024). Partial Label Learning with Focal Loss for Sea Ice Classification Based on Ice Charts. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, *17*. https://doi.org/10.1109/JSTARS.2024.3413003

- Roell, Y., Pezzi, L., Lozano-Parra, A., Olson, D., Messina, J., Quandelacy, T., **Karimzadeh, M.**, Jaenisch, T. (2024). Assessing vulnerability for future Zika virus outbreaks using seroprevalence data and environmental suitability maps. *PLOS Neglected Tropical Diseases*, *18*(3). https://doi.org/10.1371/journal.pntd.0012017

- Pires de Lima, R. [Ω], & **Karimzadeh, M.** (2023). Model Ensemble with Dropout for Uncertainty Estimation in Sea Ice Segmentation Using Sentinel-1 SAR. *IEEE Transactions on Geoscience and Remote Sensing*, *61*, 1–15. https://doi.org/10.1109/TGRS.2023.3331276

- Pires de Lima, R. [Ω], Vahedi, B. [*], Hughes, N., Barrett, A., Meier, W., & **Karimzadeh, M**. (2023). Enhancing sea ice segmentation in Sentinel-1 images with atrous convolutions. *International Journal of Remote Sensing*, *44*(17). https://doi.org/10.1080/01431161.2023.2248560

- **Karimzadeh, M.,** Ngo, T., Lucas, B. [Ω], & Zoraghein, H. (2023). Forecasting COVID-19 and Other Infectious Diseases for Proactive Policy: Artificial Intelligence Can Help. *Journal of Urban Health*, *100*(1). https://doi.org/10.1007/s11524-022-00714-7

- Cramer, E. Y., Huang, Y., Wang, Y., … Vahedi, B.**[*]**, Lucas, B. [Ω], Wang, Z.**[*]**, **Karimzadeh, M.**, … Consortium, U. S. C.-19 F. H. (2022). The United States COVID-19 Forecast Hub dataset. *Scientific Data*, *9*(1). https://doi.org/10.1038/s41597-022-01517-w

- Lucas, B. [Ω], Vahedi, B.**[*]**, & **Karimzadeh, M.** (2022). A spatiotemporal machine learning approach to forecasting COVID-19 incidence at the county level in the USA. *International Journal of Data Science and Analytics*. https://doi.org/10.1007/s41060-021-00295-9

- Vahedi, B. [*], **Karimzadeh, M.** & Zoraghein, H. (2021) Spatiotemporal prediction of COVID-19 cases using inter- and intra-county proxies of human interactions. *Nature Communications (12)*6440. https://doi.org/10.1038/s41467-021-26742-6

- Snyder, L. [*], Lin, Y., **Karimzadeh, M.**, Goldwasser, D., & Ebert, D. S. (2020). Interactive Learning for Identifying Relevant Tweets to Support Real-time Situational Awareness. *IEEE Transactions on Visualization and Computer Graphics*, *(26)*1. https://doi.org/10.1109/TVCG.2019.2934614

- Khayat, M. [*], **Karimzadeh, M.**, Zhao, J.[*], & Ebert, D. S. (2020). VASSL: A Visual Analytics Toolkit for Social Spambot Labeling. *IEEE Transactions on Visualization and Computer Graphics*, *(26)*1. https://doi.org/10.1109/TVCG.2019.2934266

- Zhao, J. [*], **Karimzadeh, M.**, Snyder, L. S. [*], Surakitbanharn, C., Qian, Z. C., & Ebert, D. S. (2020). MetricsVis: A Visual Analytics System for Evaluating Employee Performance in Public Safety Agencies. *IEEE Transactions on Visualization and Computer Graphics*, *(26)*1. https://doi.org/10.1109/TVCG.2019.2934603

- Khayat, M. [*], **Karimzadeh, M.**, Ebert, D. S., Ghafoor, A. (2020b). The Validity, Generalizability and Feasibility of Summative Evaluation Methods in Visual Analytics. *IEEE Transactions on Visualization and Computer Graphics, (26)*1. https://doi.org/10.1109/TVCG.2019.2934264

- Yau, C. [*], **Karimzadeh, M.**, Surakitbanharn, C., Elmqvist, N., & Ebert, D. S. (2019). Bridging the Data Analysis Communication Gap Utilizing a Three-Component Summarized Line Graph. *Computer Graphics Forum*, *38*(3). https://doi.org/10.1111/cgf.13696

- **Karimzadeh, M.,** & MacEachren, A. M. (2019). GeoAnnotator: A Collaborative Semi-Automatic Platform for Constructing Geo-Annotated Text Corpora. *ISPRS International Journal of Geo-Information*, *8*(4). https://doi.org/10.3390/ijgi8040161
- **Karimzadeh, M.**, Pezanowski, S., Wallgrün, J. O., MacEachren, A. M., & Wallgrün, J. O. (2019). GeoTxt: A scalable geoparsing system for unstructured text geolocation. *Transactions in GIS, 23*(1). https://doi.org/10.1111/tgis.12510
- Wallgrün, J. O., **Karimzadeh, M.**, MacEachren, A. M., & Pezanowski, S. (2018). GeoCorpora: building a corpus to test and train microblog geoparsers. *International Journal of Geographical Information Science*, *32*(1). https://doi.org/10.1080/13658816.2017.1368523

PEER-REVIEWED CONFERENCE PROCEEDING ARTICLES

- **Karimzadeh, M.**, Hance, B. [*], Posen, A. [*], Sherwood, R. [*], & Su, T. [*] (2023). Characterizing Spatial Accessibility of COVID-19 Testing and Vaccination Sites using Dasymetric Mapping and GIS. *Advances in Cartography and GIScience of the ICA*, *4*, 12. https://doi.org/10.5194/ica-adv-4-12-2023
- **Karimzadeh, M.**, Han, H.[*], Tellman, B., & Nielsen, E. (2021). Classifying Narcotrafficking Spatial Event Documents using Transformers. *2nd Spatial Data Science Symposium (SDSS) UC Santa Barbara: Center for Spatial Studies*. https://doi.org/10.25436/E2B88Q
- Wang, G. [*], Guo, J., Tang, M., Queiroz Neto, J. F. de, Yau, C. [*], Daghistani, A., **Karimzadeh, M.**, Aref, W. G., & Ebert, D. S. (2020). Stull: Unbiased online sampling for visual exploration of large spatiotemporal data. *2020 IEEE Conference on Visual Analytics Science and Technology (VAST).* https://doi.org/10.1109/vast50239.2020.00012
- Zhao, J. [*], **Karimzadeh, M.**, Xu, H., Malik, A., Afzal, S., Wang, G., Elmqvist, E., & Ebert, D. (2020). Route Packing: Geospatially-Accurate Visualization of Route Networks. *In Proceedings of the 53rd Hawaii International Conference on System Sciences,* https://arxiv.org/abs/1909.10173
- Snyder, L. S. [*], **Karimzadeh, M.**, Chen, R., & Ebert, D. S. (2019). City-level geolocation of tweets for real-time visual analytics. *Proceedings of the 3rd ACM SIGSPATIAL International Workshop on AI for Geographic Knowledge Discovery, GeoAI 2019*. https://doi.org/10.1145/3356471.3365243
- Zhao, J. [*], **Karimzadeh, M.**, Masjedi, A., Wang, T., Zhang, X., Crawford, M. M., & Ebert, D. S. (2019). FeatureExplorer: Interactive Feature Selection and Exploration of Regression Models for Hyperspectral Images. *2019 IEEE Visualization Conference, VIS 2019*. https://doi.org/10.1109/VISUAL.2019.8933619
- Snyder, L. S. [*], **Karimzadeh, M.**, Stober, C., & Ebert, D. S. (2019). Situational Awareness Enhanced through Social Media Analytics: A Survey of First Responders. *IEEE International HST Symposium, Woburn, MA,* https://arxiv.org/abs/1909.07316
- Wallgrün, J. O., Hardisty, F., MacEachren, A. M., **Karimzadeh, M.**, Ju, Y., & Pezanowski, S. (2014). Construction and First Analysis of a Corpus for the Evaluation and Training of Microblog/Twitter Geoparsers. *Proceedings of the 8th Workshop on Geographic Information Retrieval*. https://doi.org/10.1145/2675354.2675701

PEER-REVIEWED CONFERENCE SHORT PAPERS

- Taleghan, S. A., **Karimzadeh, M.**, Barrett, A. P., Meier, W. N., & Banaei-Kashani, F. (2024). Semi-Supervised Multi-Source Sea Ice Classification in Small-Data Regime. *2024 IEEE International Conference on Big Data (BigData).* https://doi.org/10.1109/BigData62323.2024.10825475

- Wang, Z. [*], Pires de Lima, R. [Ω], Crooks, J. L., Regan, E. A., & **Karimzadeh, M.** (2023). Increasing the Spatial Coverage of Atmospheric Aerosol Depth Measurements using Random Forest and Mean Filters. *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium*. https://doi.org/10.1109/IGARSS52108.2023.10282685
- **Karimzadeh, M.,** & Pires de Lima, R [Ω]. (2023). Deep Learning on SAR Imagery: Transfer Learning Versus Randomly Initialized Weights. *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium* https://doi.org/10.1109/IGARSS52108.2023.10281892
- Pires de Lima, R. [Ω], Vahedi, B. [*], & **Karimzadeh, M.** (2023). Comparison of Cross-Entropy, Dice, and Focal Loss for Sea Ice Type Segmentation. *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium*. https://doi.org/10.1109/IGARSS52108.2023.10282060
- Lyons-Galante, I. [*], **Karimzadeh, M.,** Molnar, S., Johnson, G., & Gruchalla, K. (2023). Alternatives to Contour Visualizations for Power Systems Data. *2023 Workshop on Energy Data Visualization (EnergyVis)*. https://doi.org/10.1109/EnergyVis60781.2023.00009
- **Karimzadeh, M.** (2019). Social Media for Sensing: Do Tweets Represent Events at Geo-Tagged Locations? *Abstracts of the International Cartographic Association (1)*. https://doi.org/10.5194/ica-abs-1-160-2019
- **Karimzadeh, M.** (2016). Performance evaluation measures for toponym resolution. *Proceedings of the 10th Workshop on Geographic Information Retrieval, GIR 2016*. https://doi.org/10.1145/3003464.3003472
- Wallgrün, J. O., Klippel, A., & **Karimzadeh, M.** (2015). Towards Contextualized Models of Spatial Relations. *Proceedings of the 9th Workshop on Geographic Information Retrieval*. https://doi.org/10.1145/2837689.2837692
- **Karimzadeh, M.**, Huang, W., Banerjee, S., Wallgrün, J. O., Hardisty, F., Pezanowski, S., Mitra, P., & MacEachren, A. M. (2013). GeoTxt: A web API to leverage place references in text. *Proceedings of the 7th Workshop on Geographic Information Retrieval, GIR 2013*. https://doi.org/10.1145/2533888.2533942

PEER-REVIEWED BOOK CHAPTERS

- Karimzadeh, M. (2024). *Texts*. In John P. Wilson (Ed.), The Geographic Information Science & Technology Body of Knowledge. https://doi.org/10.22224/gistbok/2024.1.8
- Karimzadeh, M., Zhao, J., Wang, G., Snyder, L. S., & Ebert, D. S. (2020). *Human-guided visual analytics for big data.* In S. E. Woo, L. Tay, & R. W. Proctor (Eds.), *Big data in psychological research* (p. 145–177). American Psychological Association. https://doi.org/10.1037/0000193-008

INVITED TALKS

- Panelist: GeoAI and Deep Learning Symposium: Representing geographic locations in AI models: Methods and Applications, American Association of Geographers annual meeting, Detroit, MI, Mar. 2025.
- Locate the Floe: Challenges in High-resolution Mapping of Sea Ice using Machine Learning, University of South Florida, Center for Ocean Mapping and Innovative Technologies, June 2022
- Revisiting Spatial Dependence and Nonlinearity in the Era of Spatial Data Science, University of Auckland, New Zealand, June 2022

- Short-term Forecasting of COVID-19 using Spatiotemporal Machine Learning, Institute for Behavioral Science, University of Colorado Boulder, Feb 2022
- Short-term Forecasting of COVID-19 using Spatiotemporal Machine Learning, Department of Geography and Environmental Science, University of Colorado Denver, Feb 2022
- Forecasting County-Level COVID-19 Cases using Spatiotemporal Machine Learning, Social Media Connectedness, and Cell-Phone Movement Data. *Department of Computer Science, University of Colorado Boulder*. Apr. 2021.
- Forecasting County-Level COVID-19 Cases using Spatiotemporal Machine Learning, Social Media Connectedness, and Cell-Phone Movement Data. *Mexico's National Institute of Public Health, Population Council's Population, Environmental Risk and Climate Change Initiative (PERCC).* Mexico City (virtual). Mar. 2021.
- Interactive Machine Learning for Heterogenous Geospatial Data. *Department of Geography, University of Florida (virtual).* Feb. 2021.
- Interactive Machine Learning and Labeling for Harmonizing Heterogenous Geospatial Data. *Department of Geography, University of Cincinnati (virtual).* Sep. 2020.
- Visual Analytics and Interactive Machine Learning for Geospatial Sciences and Cryospheric Research, Arctic Research Consortium of the U.S. (ARCUS). *Sea Ice Prediction Network webinar series.* Jul. 2020.
- Visual Analytics and Interactive Machine Learning for Geospatial Sciences. *National Snow and Ice Data Center (NSIDC).* Boulder, CO, Mar. 2020.
- Text Meets Geography: Geolocation, Computation, and Geovisual Analytics, Information Science Seminar Series, *University of Colorado Boulder*. Boulder, CO, Feb. 2020.

CONFERENCE PRESENTATIONS

- Karimzadeh, M., Pires de Lima, R. (2025). AI and Sea Ice Mapping: What's the Challenge? *GeoAI and Deep Learning Symposium, AAG Annual Meeting*. Detroit, MI.
- Jalayer, S., Pires de Lima, P., Taleghan, S., Karimzadeh, M., (2025). A Comprehensive Analysis for Automating Sea Ice mapping based on a Multi-task DeepLabV3 model. *GeoAI and Deep Learning Symposium, AAG Annual Meeting*. Detroit, MI.
- Karimzadeh, M., Pires de Lima, R. (2024). Characterizing Uncertainty in CNN-based Sea Ice Segmentation using Sentinel-1 SAR. *International Ice-Charting Working Group Annual Meeting.* Monterey, CA.
- Karimzadeh, M., Pires de Lima, R. (2024). Model Ensemble with Dropout for Uncertainty Estimation in Segmentation of Sea Ice in Sentinel-1 SAR. *GeoAI and Deep Learning Symposium, AAG Annual Meeting*. Honolulu, HI.
- Karimzadeh, M., & Pires de Lima, R. (2023) Segmentation of Sea Ice in Sentinel-1 SAR with Atrous Convolutions. *AGU Fall Meeting.* San Francisco, CA.
- Karimzadeh, M., Simpson, C., & Korinek, N. (2023) Forecasting Post-Fire Vegetation Recovery Using Deep Learning. *AGU Fall Meeting*. San Francisco, CA.
- Karimzadeh, M., & Romero, J. (2023). Spatiotemporal Graph Neural Networks for Action Segmentation using Multimodal Data. *NSF Personalized Pervasive Intelligence Center Fall semi-annual board meeting,* Flint, MI.
- Romero, J., Lv, Q., & Karimzadeh, M. (2023). Representation Learning on Geospatial Data for Encoding Urban Characteristics. Symposium on Harnessing the Geospatial Data Revolution: Impacts of Managing and Modeling Geospatial Big Data, *AAG annual meeting*, Denver, CO.

- Pires de Lima, R., Vahedi, B., Karimzadeh, M., Barrett, A. P., and Meier, W. (2023). Successes and Challenges of Sea Ice Segmentation on Sentinel-1 Synthetic Aperture Radar. *GeoAI symposium, AAG Annual Meeting*, Denver, CO.
- Karimzadeh, M. (2023) Spatiotemporal Deep Learning for Incidence Forecasting and Exposure Characterization. *Harvard Center for Geospatial Analysis annual meeting: From Geospatial Research to Health Solutions.* Cambridge, MA.
- Romero, J., Lv, Q., & Karimzadeh, M. (2023). Learning Spatial Representations from Multimodal Data: An Application in Encoding Urban Neighborhoods. *NSF Personalized Pervasive Intelligence Center Spring semi-annual board meeting,* Boulder, CO.
- Vahedi, B., Lucas, B., Banaei-Kashani, F., Barrett, A., Meier, W., & Karimzadeh, M. (2022). Sea Ice Type Classification using Deep Convolutional Networks and Partial Label Learning. *AGU Fall Meeting 2022.*
- Vahedi, B., Pires de Lima, R., Lucas, B., & Karimzadeh, M. (2022). Semantic Segmentation of Sea Ice Using Multi-scale Spatial Context. *AGU Fall Meeting 2022.*
- Alkaee Taleghan, S., Vahedi, B., Karimzadeh, M., Barrett, A., Meier, W. & Banaei-Kashani, F. (2022). MIPL-Ice: A Multi-Instance Proportion-Label Learning Method for Polygon-Level Sea Ice Classification. *AGU Fall Meeting 2022*.
- Karimzadeh, M., Lucas, B., Barrett, A. P., Meier, W. N., & Banaei-Kashani, F. (2022). Enhancing Denoising of Sentinel-1 Extra Wide Mode Using Convolutional Encoder-Decoder Networks. *EarthCube Annual Meeting 2022*
- Karimzadeh, M. (2022). Big Data Community Algorithms: Deep Learning for Mapping. *Open Source Science (OSS) for Earth System Observatory (ESO) Mission Science Data Processing Study, NASA workshop.* Zenodo. https://doi.org/10.5281/zenodo.6320982
- Vahedi, B., Lucas, B., Karimzadeh, M., Khalsa, S. J., Meier, W. N., Barrett, A. P., & Banaei-Kashani, F. (2021). A Comparison of Classic Deep Learning Architectures For Sea Ice Classification From SAR. *AGU Fall Meeting 2021*. AGU. Link (Outstanding Student Presentation Award).
- Vahedi, B., Lucas, B., Khalsa, S. J., Meier, W. N., Barrett, A. P., Lie, T., Banaei-Kashani, F. & Karimzadeh, M. (2021). Sea Ice Type Classification from Sentinel-1 SAR Imagery Using Deep Neural Networks. *AGU Fall Meeting 2021*. AGU. Link.
- Vahedi, B., Lucas, B., Barrett, A. P., Khalsa, S. J., Meier, W. M., Lie, T., Banaei-Kashani, F., Karimzadeh M (2021). Sea Ice Type Classification Using Convolutional Neural Networks, *European Space Agency (ESA) Phi Week 2021*.
- Vahedi, B., Karimzadeh, M., Khalsa, S. J., Meier, W., Barret, A., Lucas, B., & Banaei-Kashani, F. (2021). Sea ice type classification in the Chukchi sea using deep learning, *2021 EarthCube Annual Meeting.* https://doi.org/10.6084/m9.figshare.14772891.v1
- Karimzadeh, M., Snyder, L., Chen, R., Ebert, D. (2020). City-level Geolocation of Tweets for Real-time Visual Analytics. *GeoAI Symposium: AI for Geographic Information Retrieval and Geo-Text Analysis.* AAG annual meeting, Denver, CO (virtual).
- Karimzadeh, M., Snyder, L., Lin, Y., Ebert, D. (2019). Interactive Deep Learning for Identifying Relevant Social Media Posts in Crisis Monitoring. *GeoAI and Deep Learning Symposium: Deep Learning in Geography*. AAG annual meeting, Washington, DC.
- Jhanwar, G., Karimzadeh, M., Ebert, D., Yau, C., Tadesse, K. (2019). Irrigation Management Using Deep Learning of Soil Moisture. *GeoAI and Deep Learning Symposium: Deep Learning in Geography*. AAG annual meeting, Washington, DC.
- Karimzadeh, M., MacEachren, A. M., Pezanowski, S. (2018). Evaluating GeoTxt, a Scalable Geoparser for Toponym Recognition and Resolution. *Artificial Intelligence and Deep Learning*

Symposium: Geospatial Semantics and Geo-Text Data Analytics. AAG annual meeting, New Orleans, LA.

- Karimzadeh, M. (2017). Geolocation of Textual Documents: a GeoVisual Approach. *North American Cartographic Information Society (NACIS) annual meeting*. Montreal, Canada.
- Wallgrün, J.O., Hardisty, F., MacEachren, A. M., Karimzadeh, M., Ju, Y., Pezanowski, S. (2014). Construction of a Corpus for the Evaluation and Training of Microblog/Twitter Geoparsers. *US Army Corps of Engineers Site Visit.* GeoVISTA Center, Penn State, PA.
- Karimzadeh, M. (2014). Place Names for Geographic Information Retrieval: Current Status and Future Data Requirements. *Session on Geospatial Cyberinfrastructure to Support Sustained Polar and Environmental Sciences*. AAG annual meeting, Tampa, FL.
- Karimzadeh, M., Huang, W., Banerjee, S., Wallgrün, J.O., Hardisty, F., Pezanowski, S., Mitra P., MacEachren, A.M. (2013). GeoTxt API for Geoparsing Text: 'tunable' entity extraction and geolocation for microblogs and other sources. *VACCINE site visit*. Penn State, PA.
- Karimzadeh, M. (2013). GeoCollaboration in Global Environmental Change Research, *AAG annual Meeting*, Los Angeles, CA.
- Karimzadeh, M. (2013). GeoTxt: Current Status, Progress Report, Future Directions. *US Army Corps of Engineers Site Visit*, GeoVISTA Center, Penn State, PA.
- Karimzadeh, M. (2013). Participatory Crisis Management: GeoCollaboration at Three Levels. *UCGIS Symposium, Collaboration Across Communities: GIScience 2.0 and Beyond*. Washington, DC.

RESEARCH & TECHNICAL WHITE PAPERS

- Karimzadeh, M., Snyder, L., Ebert, D. (2019) Geovisual Analytics and Interactive Machine Learning for Situational Awareness. *US National Report to the International Cartographic Association, ICC 2019, Tokyo, Japan.*
- Ebert, D., Yau, C., Valero, A., Karimzadeh, M., Guo, J., Asimont, L., Butzke, C. (2018). Discussions on Increasing the Sustainability of Perennial Crops through Informed Precision Decision-Making. *Purdue VACCINE workshop reports*. https://docs.lib.purdue.edu/purvacwr/1
- Schwartz, B., Scarborough, J., Karimzadeh, M., Aher, P., Ditizio, A. M., Alger, M. (2017). Economic and Spatial Analysis for Gas to Liquid (GTL) Plant Feasibility Study, *Report to Synfuels Americas*. The Institute for Natural Gas Research, Penn State.
- Savelyev, A., MacEachren, A.M., Pezanowski, S., Karimzadeh, M., Luo, W., Nelson, J., Robinson, A.C. (2014). Report on New Methods for Representing and Interacting with Qualitative Geographic Information, Stage 2: Task Group 4 Message-Focused Use Case. *Report to US Army Engineer Research and Development Center (ERDC) Geospatial Research Laboratory*. GeoVISTA Center, Penn State.

PUBLISHED DATA & SOFTWARE

- Wang, Z.*, Crooks, J., Regan, M., Karimzadeh, M. (2025) 1km Estimates of Daily PM2.5 Levels in the Contiguous United States from 2005 to 2021.
- Marler, A.*, Roell, Y., Jaenisch, T., Karimzadeh, M. (2024) GeoDEN: A Visual Analytics Framework for Spatiotemporal Analysis of Dengue Serotypes: https://geoden.net/
- Miller, J.*, Gries, L., Karimzadeh, M. (2024) The Swastika Counter Project: Interactive Map: https://geohai.github.io/SwastikaCounterMap/

- Pires de Lima, R. [Ω], Vahedi, B. & Karimzadeh, M. (2023) Open-source model for training convolutional neural network with atrous convolutions to segment sea ice using Synthetic Aperture Radar (SAR) for operational use https://github.com/geohai/sea-ice-segment
- Wang, Z. [*], Karimzadeh, M. (2023) Open-source predictive model and daily COVID-19 state-level hospitalization forecasting, and submissions to the COVID-19 Forecast Hub, used by CDC in national reporting: https://github.com/geohai/covid-lstm-hosp
- Lucas, V., Vahedi, B., Karimzadeh, M. (2021) Open-source predictive model and weekly COVID-19 case forecasting and submissions to the COVID-19 Forecast Hub, used by CDC in national reporting:
    https://www.cdc.gov/coronavirus/2019-ncov/science/forecasting/forecasts-cases.html
    https://github.com/geohai/covid-lstm
- Karimzadeh, M., Pezanowski, S., MacEachern, M. (2017) GeoTxt.org geoparser for geolocation of places in text: https://github.com/geovista/GeoTxt
- Karimzadeh, M., MacEachern, M. (2017) GeoAnnotator Semi-automatic text geoAnnotation System: https://github.com/geovista/GeoTxt

SELECT OUTREACH & SCHOLARLY WORK IN THE NEWS
- Facebook data helps CU researchers predict COVID surges, *9News*, Apr. 7, 2022. https://www.9news.com/article/news/local/social-media-data-helps-predict-covid-surges/73-e1e3a90d-8f99-470f-b19d-035c86ca34a6
- Recent CU Boulder studies show how Facebook can help with forecasts, *Boulder Daily Camer,.* Mar. 28, 2022. https://www.dailycamera.com/2022/03/27/university-of-colorado-boulder-recent-studies-shows-facebook-data-can-help-forecast-covid-19-surges/
- How social media data could help predict the next COVID-19 surge, *CU Boulder Today*, Mar. 18, 2022. https://www.colorado.edu/today/2022/03/18/how-social-media-data-could-help-predict-next-covid-19-surge
- Scientists aim to fuse Earth data to help classify, map sea ice, *Colorado Arts and Sciences Magazine*, Dec. 17, 2020. https://www.colorado.edu/asmagazine/2020/12/17/scientists-aim-fuse-earth-data-help-classify-map-sea-ice

RESEARCH GRANTS AND AWARDS
- *Senior Personnel*, Understanding Future Sea Level Change by Combining NASA Satellite Observations and Climate Models Using Machine Learning, *NASA ROSES 2023 A.10 Sea Level Change Science Team.* May 2024-Apr. 2028, $1.2M total, self $0 as senior personnel (PI Steve Nerem, Aerospace Engineering, University of Colorado Boulder)
- *Principal Investigator,* Machine learning for Sea Ice Characterization using ICESat-2 and multi-SAR Data, *NASA ROSES 2023 A.32 Studies with ICESat-2,* Jan. 2024-Dec. 2026 $400K total/self (co-PI Rafael Pires de Lima, University of Colorado Boulder)
- *Principal Investigator*, Context-preserving spatiotemporal representation learning and anomaly detection for IoT Data, funded by Intel (through NSF Pervasive Personalized Intelligence Center), Aug. 2023-Dec. 2023, $57K total/self
- *Principal Investigator*, Forecasting COVID-19 in the Presence of Inconsistent Reporting, funded by the *University of Colorado Boulder (CU) Population Center seed grant,* Sept. 2022-Aug 2023, $13K total/self

- *Principal Investigator*, Human-computer interaction and machine learning techniques for energy systems, funded by the *National Renewable Energy Lab*, Aug. 2022-Jul. 2024, ~$184K total/self
- *Senior Personnel*, Effects of air pollution on the severity of COVID-19 funded by the *National Institutes of Health* to *National Jewish Health (NJH)*, Jan. 2022-Aug. 2023, sub-contract ~$113K self (PI Elizabeth Ragan, NJH; co-PI James Crooks, NJH)
- *Principal Investigator,* High Resolution Spatiotemporal Forecasting of COVID-19 Incidence using Machine Learning, funded by *Population Council*, Oct. 2021-Mar. 2022, ~$60K total/self
- *Principal Investigator*, Recovering from a Pandemic: Unraveling Neighborhood Geographic Disparities in Consumer and Business Behavior in 2021, funded by the *University of Colorado Boulder Research & Innovation Seed Grant*, Aug. 2021-Dec. 2022, $50K total/self (co-PI Terra McKinnish, University of Colorado Boulder)
- *Principal Investigator*, Spatiotemporal Forecasting of COVID-19 Cases and Early Detection of Variant Hotspots, funded by *University of Colorado Boulder (CU) Population Center,* Jun. 2021-Sept. 2022 (Summer GRA support ~$2K, Rapid Award ~$3K) total/self $5K
- *Principal Investigator*, Collaborative Research: EarthCube Data Capabilities: Enabling Analysis of Heterogeneous, Multi-source Cryospheric Data, funded by *National Science Foundation*, Sept. 2020-Sept 2024 ~$1.2M total, ~$719K self (co-PIs: Andrew Barrett, NSIDC; Walt Meier, NSIDC; Siri Jodha Khalsa, NSIDC; Farnoush Banaei-Kashani, University of Colorado Denver)

TRAVEL AWARDS
- The U.S. National Committee (USNC) to the International Cartographic Association travel award to present at the 31th International Cartographic Conference in Cape Twon, South Africa, Aug. 2023 ($2700).
- The U.S. National Committee (USNC) to the International Cartographic Association travel award to present at the 29th International Cartographic Conference in Tokyo, Japan, Jul. 2019 ($2000).
- ICC2019 Travel Grant to present at the 29th International Cartographic Conference in Tokyo, Japan, Jul. 2019 (100,000 JPY ~ $910).
- NSF Travel Award to attend the 24th SIGSPATIAL Conference in San Francisco, CA, Nov. 2016 ($1000).
- FOSS4G (Free and Open Source Software for Geospatial) North America Scholarship Award, 2016 (600).
- NSF Travel Award to attend the 27th International Cartographic Conference (ICC) Conference in Rio, Brazil, Aug. 2015 ($1800 - did not use/attend due to visa travel restrictions).
- NSF Travel Award to attend the 22th SIGSPATIAL 2014 Conference in Dallas, TX, Nov. 2014 ($1000).
- North American Cartographic Information Society (NACIS) travel award to attend the NACIS annual meeting in Pittsburg, PA, Oct. 2014.
- Ruby S. Miller Endowment Fund in Geography, Academic Enrichment Support travel award from Penn State dept. of Geography to attend the International conference on Social Computing, Behavioral Modeling and Prediction, Apr. 2014.
- NSF Travel Award to attend the 7th Conference on Web Reasoning and Rule Systems, Mannheim, Germany, Jul. 2013.
- Registration Scholarship from GeoDecisions Co. to attend the 2013 Pennsylvania GIS Conference, State College, PA, Jun. 2013.

- C. Gregory Knight Academic Enrichment Support travel award from the Department of Geography, Penn State, to attend the UCGIS symposium, Washington D.C., May. 2013.

TEACHING AND COURSE DEVELOPMENT

University of Colorado Boulder (2019-present)
- GEOG 5100 IBS (2) Professionalization Seminar, Fall 2022 through Spring 2024)
- GEOG 4003/5100 (4) Machine Learning and Spatial Data
- GEOG 3023 (4) Statistics and Geographic Data
- GEOG 4043/5043 (3) Advanced Geovisualization and Web Mapping
- GEOG 4203/5203 (4) Geographic Information Science: Spatial Modeling

The Ohio State University
- **Instructor**, *Spatial Data Analysis* (GEOG 5100 – senior/graduate level), *Geovisualization* (GEOG 5201 – senior/graduate level), Dept. of Geography, Fall 2017–Spring 2018.

Penn State
- **Teaching Assistant**, *Dynamic Cartographic Representation*, Dept. of Geography, Fall 2016.
- **Instructor**, *Geographic Information Systems (GIS)*, Dept. of Geography, Fall 2015.
- **Course outline and content evaluator, editor, and developer**, *Open Web Mapping*, MGIS program, Penn State's John A. Dutton e-Education Institute, Fall 2012.

Azad University of Shahr-e-Rey, Tehran, Iran
- **Instructor and course developer,** *Computer Cartography and Desktop GIS (Introduction to GIS)* (course developer and instructor); *Precise GPS Geodetic Surveying* (course developer and instructor); *Geodetic Astronomy* (instructor), Sept. 2011–Jun. 2012.
- **Teaching Assistant**, **GPS and its use in GIS**, Jan. 2010–Jan. 2011.

ADVISING & MENTORING

- PhD advisees:
  - Jen MacDonald, PhD Student, Computer Science, started fall 2023
  - Sepideh Jalayer, PhD Student, Geography, started fall 2023
  - Zhongying Wang, PhD student, Geography; started fall 2021
  - Julia Romero (co-advised by Dr. Qin Lv), PhD student, Computer Science; started fall 2020
  - Behzad Vahedi, PhD student, Geography; started fall 2020, graduated fall 2024, currently at Google X
- MA. and MSc. advisees:
  - Kevin Lane, MSc student, Computer Science, started fall 2023
  - Claire Simpson, MA student, Geography; started fall 2022, graduated spring 2024, currently with the Natural Capital Project, Stanford University
  - Isaiah Lyons-Galante, MA student, Geography; started fall 2022, graduated spring 2024, currently PhD student at the Environmental Studies, University of Colorado Boulder.
- Thesis and dissertation committee Memberships:
  - Guiye Li, PhD Candidate, PhD candidate, Geography; Chair: Dr. Guofeng Cao
  - Caitlin Maire Mc Shane, PhD candidate, Geography; Chair: Dr. Stefan Leyk
  - Jay Kon, Undergrad Honors thesis; defended, Apr. 2023; Chair: Prof. Julie K. Lundquist
  - Nathan Korinek, MA candidate, Geography; defended Apr. 2024; Chair: Dr. Jennifer Balch
  - Georgios Charisoulis, PhD Candidate, Geography; did not defend; Chair: Dr. Barbara Buttenfield
  - William Seites-Rundlett, PhD Candidate, Civil Engineering; defended Jun. 2022; Chairs: Dr. Cristina Torress-Machi, Dr. Ross Corotis
  - Kate Carlson, MA, Geography; defended Jul. 2021; Chair: Dr. Barbara Buttenfield.

- o Kylen Solvik, MA, Geography; defended Apr. 2020; Chair: Dr. Jennifer Balch.
- GRA supervisees:
  - o Matthew Beveridge, PhD Student, Computer Science, Columbia University, Visiting Scholar Jun. 2023-Aug. 2023
- Current postdoctoral scientist mentees:
  - o Dr. Daehyeon Han, postdoctoral associate, Geography (Jul. 2024-current); supported by NSF EarthCube award and NASA Studies with ICESat-2 award to work on multi-sensor data fusion using deep learning for sea ice mapping.
- Former postdoctoral scientist mentee:
  - o Dr. Rafael Pires de Lima, postdoctoral associate, Geography (Jun. 2022-Jun. 2023); supported by NSF EarthCube Award to work on multi-SAR data fusion using deep learning for sea ice mapping.
  - o Dr. Benjamin Lucas, postdoctoral associate, Geography (Apr. 2021-Aug. 2022), supported by NSF EarthCube, RIO Seed and Population Council grants; worked on COVID-19 geographic forecasting, SAR image denoising for sea ice mapping; Current: Assistant Professor of Statistics and Applied Math, University of Northern Arizona
- Former Undergraduate mentorship
  - o Aidan Marler, BA, Geography and Geology (undergraduate research assistant 2023-2024)
  - o Jason Miller, BA, Geography (undergraduate research assistant 2021-2022)
  - o Huilin Han, BSc, Computer Science (UROP, Summer 2021); current: Masters student in Computer Science, University of Colorado Boulder

Previous institutes
- Graduate research mentor as a postdoctoral scientist, Purdue University Visual Analytics Center (PURVAC), Jul. 2018 – Aug. 2019.
  - o Luke Snyder, MSc., Computer Science;
  - o Jieqiong Zhao, PhD, Electrical and Computer Engineering;
  - o Guizhen Wang, PhD, Electrical and Computer Engineering
  - o Mosab Khayat, PhD, Electrical and Computer Engineering
  - o Calvin Yau, PhD, Electrical and Computer Engineering
  - o Gourav Lalitkumar Jhanwar, MSc. Industrial Engineering
- Undergraduate Research Advisor, Purdue University Discovery Park Undergraduate Research Internship Program (DURI), Jul. 2018–Aug. 2019.

MENTEE & STUDENT SELECT AWARDS
- Julia Romero (Graduate Research Assistant and PhD Advisee) - Award for Most Impactful Research, NSF IUCRC (Industry-University Research Partnerships), Pervasive Personalized Intelligence Center. Spring, 2024.
- Behzad Vahedi (Graduate Research Assistant and PhD Advisee) awarded Outstanding Student Presentation Award by the American Geophysical Union (AGU Fall 2021 meeting) (advisee and graduate research assistant). Fall, 2022.
- Huilin Han (Undergraduate Research Assistant) awarded UROP award (Undergraduate Research Opportunities Program), *University of Colorado Boulder*. Summer, 2021.
- Kylen Solvik (Teaching Assistant) awarded Graduate Teaching Award, *Department of Geography, University of Colorado Boulder*. Apr. 2021.
- Claire Mercer (Undergraduate Student) awarded USGIF Undergraduate Scholarship 2018.

PROFESSIONAL SERVICE

Department

- Newsletter Committee, Department of Geography, University of Colorado Boulder, Aug. 2022 – present.
- Graduate Committee, Department of Geography, University of Colorado Boulder, Jul. 2021 – May 2022.
- Colloquium Committee Chair, Department of Geography, University of Colorado Boulder, Jul. 2020 – May 2021.
- Colloquium Committee, Department of Geography, University of Colorado Boulder, Aug. 2019-present.

College and University

- Professionalization Seminar Series Host, Institute of Behavioral Science, Aug 2022 – April 2024
- Affiliate Faculty, Digital Humanities Graduate Certificate
- Faculty Mentor, Masters of Science in Data Science

Previous Institutes

- Elected Delegate and Executive Board Member, Penn State Graduate and Professional Student Association, May 2014 – May 2015.
- Elected student representative to the Graduate Council, Graduate School, Penn State, May 2014 – Oct. 2016.
- Student Liaison to the Penn State Health Insurance Advisory Committee and Board, Appointed Aug. 2014 – Oct. 2016.
- Student volunteer organizer, ISCRAM conference, Penn State, May 2014.
- Geodetic undergraduate student science journal editor and graphic designer, Geomatics department, SRTTU University, 2007-2008.

COMMUNITY & PEER REVIEW SERVICE

- Scientific committee: 32nd International Cartographic Conference (ICC 2025), Vancouver, Canada, Aug. 2025.
- Session chair, organizer and discussant, GeoAI and Deep Learning Symposium: AI and Remote Sensing for Polar and Sea Ice Monitoring and Forecasting, American Association of Geographers annual meeting, Detroit, MI, Mar. 2025.
- Session Organizer, GeoAI and Deep Learning Symposium: GeoAI for Disaster Resilience, American Association of Geographers annual meeting, Detroit, MI, Mar. 2025.
- Session chair, organizer and discussant, GeoAI and Deep Learning Symposium: Deploying AI for Geospatial Data and Remote Sensing: Advances, Challenges and Obstacles, American Association of Geographers annual meeting, Denver, CO, Mar. 2023.
- Session chair, organizer and discussant, GeoAI and Deep Learning Symposium: Deploying AI for Geospatial Data and Remote Sensing: Advances, Challenges and Obstacles, American Association of Geographers annual meeting, Denver, CO, Mar. 2023.
- Program Committee: First International Workshop on Geographic Information Extraction from Texts (GeoExT), in conjunction with the 45th European Conference on Information Retrieval (ECIR 2023). Dublin, Ireland, Apr. 2023

- Session chair and organizer, GeoAI Symposium: AI for Geographic Information Retrieval and Geo-Text Analysis, virtual session, American Association of Geographers annual meeting, virtual session, Denver, CO, Apr. 2020.
- Editorial board member, Journal of Transactions in GIS, Wiley (2022-2025)
- CU Boulder Research and Innovation Office Seed Grant Reviewer (Spring 2022)
- Program committee, GeoKG & GeoAI 2021. The 1st International Workshop on Methods, Models, and Resources for Geospatial Knowledge Graphs and GeoAI, co-located with GIScience 2021, Poznań, Poland
- Peer reviewer for journals and conferences
  - IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
  - IEEE Transactions on Geoscience and Remote Sensing
  - Total Science of Environment
  - Applied Ocean Research
  - International Journal of Geographical Information Science, Taylor & Francis
  - Journal of Geovisualization and Spatial Analysis, Springer
  - Journal of Geographical Systems, Springer
  - IEEE Access
  - EuroVis, Eurographics and IEEE
  - ISPRS International Journal of Geo-Information, MDPI
  - The Professional Geographer, Taylor & Francis
  - International Journal of Digital Earth

PROFESSIONAL MEMBERSHIP

- American Association of Geographers (AAG)
- North American Cartographic Information Society (NACIS)
- Cartography and Geographic Information Society (CaGIS)
- ACM SIGSPATIAL
- IEEE Technical Committee on Visualization and Graphics (VGTC)
- IEEE Geoscience and Remote Sensing Society (GRSS)
- National Center for Faculty Development and Diversity