

Maryam Hosseini

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Academic Positions

University of California Berkeley <i>Assistant Professor - Cities and Regional Planning</i>	Berkeley, CA 2025 – Present
Massachusetts Institute of Technology (MIT) <i>Postdoctoral Associate - Department of Urban Studies and Planning</i>	Cambridge, MA 2022 – 2024
New York University (NYU) <i>Research Associate - Computer Science Department - VIDA Lab</i>	Brooklyn, NY 2018 – 2022

Education

Rutgers University <i>Ph.D. in Urban Systems</i> Advisors: Prof. Claudio Silva, Prof. Karen Franck Dissertation: <i>A Walk in the City: Using Large Data Sets to Analyze Urban Sidewalks</i>	US 2016 – 2022
University of Warsaw <i>M.A program in International Economics</i> Thesis: <i>Lost in Urbanization: Urban sprawl and price of farmlands in Kansas State</i>	Poland 2011 – 2013
University of Tehran <i>B.A in Theoretical Economics</i>	Iran 2005 – 2010

Research Experience

Massachusetts Institute of Technology (MIT) <i>Postdoctoral Associate - Department of Urban Studies and Planning</i> <ul style="list-style-type: none">• Lead international collaborative project with HPI-Germany using cutting-edge LLMs and open-vocabulary object detection models to analyze social interactions and inform urban planning strategies.• Spearheaded development and public launch of Tile2Net, attracting outreach from 30+ cities in 11 countries eager to leverage its capabilities for improved urban infrastructure planning and pedestrian safety.• Collaborated with Falmouth City officials, leveraging Tile2Net to generate comprehensive sidewalk maps and advocate for critical infrastructure upgrades.• Engineered efficient algorithmic approaches to correct topology and connectivity of sidewalk networks, leading to 3X speed gain compared to the base code.	Cambridge, MA 2022 – Present
Rutgers Department of Social Work <i>Research Consultant</i> <ul style="list-style-type: none">• Led 'Detecting human-interpretable features from satellite imagery for poverty mapping' project, developing a semantic segmentation model to map built environment features related to poverty.• Initiated a survey-based study integrating local poverty perception into feature selection, leading to a pilot survey for 300 Lusaka households and an awarded OVPR ML/AI Pilot Seed Grant.• Identified and rectified major sources of error and bias in the study, improving modeling, data cleaning, and data management pipelines.	New Brunswick, NJ 2022 – Present
New York University (NYU) <i>Research Associate - Computer Science Department - VIDA Lab</i>	Brooklyn, NY 2018 – 2022

- Pioneered **Tile2Net**, the first open-source Python tool for planimetric mapping and sidewalk network generation from aerial imagery, enhancing efficiency and accuracy in pedestrian infrastructure analysis.
- Developed **CitySurfaces**, the first open-source model for semantic segmentation of sidewalk surface materials, achieving 90.5% mIoU on the test set from the domain cities and above 82% mIoU in 4 cities outside training domain. The data creates vital insights for UHI mitigation, stormwater management, & accessibility assessments.
- Introduced a new stage-wise active learning approach that supports real-time data annotation, decreasing annotation time from 24 minutes to 5 minutes per-image.
- Partnered with NEC to create unprecedented open-source urban intersection dataset with audio, video, & LiDAR, driving research in smart cities and accessibility.
- Initiated and secured 50k funding for a survey-based study integrating local poverty perception into feature selection for poverty estimation modeling.
- Contributed to securing several research grants, including NSF, NASA, & C2MART.
- Co-organized the first workshop on urban accessibility at ASSETS'22 conference with more than 100 participants from 6 continents.
- Co-organized Future of Global-Scale Spatial Data Collection and Analyses workshop on Urban (in)Accessibility for People with Disabilities' at SDSS 2021, attracting over 50 participants.

Rutgers University

Newark, NJ

Graduate Research Assistant - Department of Economics

2016 – 2018

- Developed python-based agent-based model from scratch to simulate New York City's real estate market, analyzed the impact of various policies like zoning, rent control, and urban growth boundaries on real estate pricing and location choice.

Skills

Programming: Python, Java Script, SQL; **Computer Vision:** Pytorch, Tensorflow; **Software:** ArcGIS Pro, EViews, Stata, Adobe Creative Cloud; **Data analysis:** Geospatial, Panel Data, Timeseries, ML-based modeling, Agent-Based Modeling

Publications

Peer-Reviewed Journal Articles.....

1. Miranda, F., Ortner, T., Moreira, G., **Hosseini, M.**, Vuckovic, M., Biljecki, F., Silva, C. T., Lage, M., & Ferreira, N. (2024). The state of the art in visual analytics for 3D urban data. *Computer Graphics Forum* (accepted to be published).
2. Omar, K. S., Moreira, G., Hodczak, D., **Hosseini, M.**, Colaninno, N., Lage, M., and Miranda, F. (2024). Deep Umbra: A Generative Approach for Sunlight Access Computation in Urban Spaces. *IEEE Transactions on Big Data*
3. **Hosseini, M.**, Sevtsuk, A., Miranda, F., Cesar Jr, R., and Silva, C. (2023). Mapping the Walk: A Scalable Computer Vision Approach for Generating Sidewalk Network Datasets from Aerial Imagery. *Computers, Environment and Urban Systems*, 101, 101950.
4. Moreira, G., **Hosseini, M.**, Nafiul Alam, M., Lage, M., Ferreira N. and Miranda, F. (2023). The Urban Toolkit: A Grammar-based Framework for Urban Visual Analytics. In *IEEE Transactions on Visualization and Computer Graphics*
5. Piadyk, Y., Rulff, J., Brewer, E., **Hosseini, M.**, Ozbay, K., Sankaradas, M., Chakradhar, S., and Silva, C. (2023). StreetAware: A High-Resolution Synchronized Multimodal Urban Scene Dataset. *Sensors*, 23, 3710.
6. **Hosseini, M.**, Miranda, F., Lin, J., and Silva, C. (2022). Citysurfaces: City-scale semantic segmentation of sidewalks surfaces. *Sustainable Cities and Society*, 79, 103630
7. Rulff, J., Miranda, F., **Hosseini, M.**, Lage, M., Cartwright, M., Dove, G., Bello, J. and Silva, C. (2022). Urban Rhapsody: Large-scale exploration of urban soundscapes. In *Computer Graphics Forum*
8. Masoumi, H.E., **Hosseini, M.**, and Gouda, A. A. (2018). Drivers of urban sprawl in two large

Middle-eastern countries: literature on Iran and Egypt. *Human Geographies–Journal of Studies & Research in Human Geography*, 12(1).

- Gouda, A. A., **Hosseini, M.**, and Masoumi, H. E. (2016). The status of urban and suburban sprawl in Egypt and Iran. *GeoScape*, 10(1), 1-15.

Peer-reviewed Conferences and Workshops.....

- Santos, C., **Hosseini, M.**, Rulff, J., Ferreira, N., Wilson, L., Miranda, F., Silva, C., and Lage, M. (2023). A visual analytics system for profiling urban land use evolution. **Honorable Mention**. In *36th SIBGRAPI Conference on Graphics, Patterns and Images*, pp. 31-36. IEEE.
- Melgar-García, L., **Hosseini, M.**, Troncoso, A. (2023). Identification of Anomalies in Urban Sound Data with Autoencoders. *International Conference on Hybrid Artificial Intelligence Systems*, pp. 27-38. Cham: Springer Nature Switzerland.
- Froehlich, J.E., Eisenberg, Y., **Hosseini, M.**, Miranda, F., Adams, M., Caspi, A., Dieterich, H., Feldner, H., Gonzalez, A., De Gyves, C., Hammel, J. (2022). The Future of Urban Accessibility for People with Disabilities: Data Collection, Analytics, Policy, and Tools. *24th International ACM SIGACCESS Conference on Computers and Accessibility*, pp. 1-8.
- Duan, M., Kiami, S., Milandin, L., Kuang, J., Saugstad, M., **Hosseini, M.**, & Froehlich, J. E. (2022). Scaling Crowd+ AI Sidewalk Accessibility Assessments: Initial Experiments Examining Label Quality and Cross-city Training on Performance. In *24th International ACM SIGACCESS Conference on Computers and Accessibility*, pp. 1-5.
- Omar, K. S., Moreira, G., Hodczak, D., **Hosseini, M.**, Miranda, F. (2022). Crowdsourcing and Sidewalk Data: A Preliminary Study on the Trustworthiness of OpenStreetMap Data in the US. In *24th International ACM SIGACCESS Conference on Computers and Accessibility, UrbanAccess Workshop*.
- Hosseini, M.**, Araujo, I.B., Yazdanpanah, H., Tokuda, E., Miranda, F., Silva, C.T., Cesar, R.M., Jr. (2021). Sidewalk Measurements from Satellite Images: Preliminary Findings. In *Spatial Data Science Symposium 2021 Short Paper Proceedings*.
- Miranda, F., **Hosseini, M.**, Lage, M., Doraiswamy, H., Dove, G., & Silva, C. T. (2020, April). Urban mosaic: Visual exploration of streetscapes using large-scale image data. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, pp. 1-15.
- Hosseini, M.**, Saugstad, M., Miranda, F., Sevtsuk, A., Silva, C. T., & Froehlich, J. E. (2022). Towards Global-Scale Crowd+ AI Techniques to Map and Assess Sidewalks for People with Disabilities. In *CVPR 2022 AVA (Accessibility, Vision, and Autonomy Meet) Workshop*.

Non-peer-reviewed Technical Reports.....

- Silva, C.T., Ozbay, K., Rulff de Costa, J., Lin, J., **Hosseini, M.**, and Tokuda, E. (2023). Exploring AI-Based Video Segmentation and Saliency Computation To Optimize Imagery-Acquisition From Moving Vehicles. *Connected Cities for Smart Mobility toward Accessible and Resilient Transportation Center (C2SMART)*
- Silva, C.T., Freire, J., Miranda, F., Lage, M., Doraiswamy, H., **Hosseini, M.**, Tokuda, E., Ferreira, G., Cesar Jr, R.M. (2019). Integrated Analytics and Visualization for Multi-modality Transportation Data. *Connected Cities for Smart Mobility toward Accessible and Resilient Transportation Center (C2SMART)*

Non-peer-reviewed Conferences and Workshops.....

- Barr, J., **Hosseini, M.**, Scheer, D. (2017). Teardowns: An Agent-Based Model. *Eastern Economic Association*.
- Barr, J., **Hosseini, M.**, Scheer, D. (2017). Simhattan: Growing the City from the Ground Up. *Society for Computational Economics*.

Book Chapters.....

- Hosseini, M.**, "Joining the party at Downtown Brooklyn", in *Routledge Handbook of Urban Public Space: Use, Design, and Management*, 2023.

Open-source Software and Data Tools

Tile2Net: [GitHub Page](#)

CitySurfaces: [GitHub Page](#)

SideSeeing Project: [Website](#)

Deep Umbra: [Website](#)

StreetAware: [Dataset Repo](#)

A Survey on Visual Analytics for 3D Urban Data: [Companion Tool](#)

Honors and Awards

SIBGRAPI - Honorable Mention: 2023

Rutgers - Graduate Assistantship: 2016-2018

Rutgers - Seed Grant Recipient: 2017-2018

Rutgers - TA/GA Summer Professional Development Fund: 2017

European Union Full Scholarship: 2011-2013

Select Media Coverage

MIT News Spotlight, "[Where the sidewalk ends?](#)", Featured, March 2023.

StreetsBlog US, "[New Tool Maps Sidewalks From the Sky — And Encourages Cities to Fill The Gaps](#)", Interview, March 2023.

Planetizen, "[Mapping Sidewalks for Improved Connectivity](#)", Featured, March 2023.

Service

Co-organizer: The Future of Urban Accessibility: The Role of AI workshop at ASSETS'24 conference

Co-organizer: The first workshop on urban accessibility at ASSETS'22 conference

Co-organizer: The Future of Global-Scale Spatial Data Collection and Analyses on Urban (in)Accessibility for People with Disabilities' workshop at SDSS 2021

Created the road and sidewalk map for Woods Hole for the community driven program to build sidewalks along the main roads, resulting in the plan being accepted by the city of Falmouth.

Reviewer.....

Nature Communication; Nature Cities; The Visual Computer (TVCJ); ACM Conference on Human Factors in Computing Systems (CHI); IEEE Visualization; PLOS ONE; ACM Transactions on Spatial Algorithms and Systems; ACM ASSETS; Computers, Environment and Urban Systems; Cities; Transportation Research Board (TRB)