# Maryam Hosseini

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## Summary

Experienced researcher with a demonstrated ability to lead projects in urban science, machine learning and computer vision. Recognized for exceptional skills in project management, statistical analysis, and creative problem-solving. Proven track record in developing tools that address complex urban planning challenges.

## Work Experience

**Massachusetts Institute of Technology (MIT)**                              **Cambridge, MA**
*Postdoctoral Associate - Department of Urban Studies and Planning*          *2022 – Present*
- Lead international collaborative project with HPI-Germany using cutting-edge LLMs and image to text algorithms 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.

- Engineered efficient algorithmic approaches to correct topology and connectivity of sidewalk networks, leading to 3X speed gain compared to the base code.

**New York University (NYU)**                              **Brooklyn, NY**
*Research Associate - Computer Science Department - VIDA Lab*          *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.

- Co-organized the first workshop on urban accessibility at ASSETS'22 conference with more than 100 participants from 6 continents.

**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.

- Teaching assistant for Intro to Macroeconomics & Advanced Macroeconomics.

## Education

**Rutgers University**                              **US**
*Ph.D. in Urban Systems*          *2016 – 2022*
Advisors: *Prof. Claudio Silva, Prof. Karen Franck*
Dissertation:*A Walk in the City: Using Large Data Sets to Analyze Urban Sidewalks*

| **University of Warsaw** | **Poland** |
|---|---|
| *Graduate courses in International Economics* | *2011 – 2013* |
| **University of Tehran** | **Iran** |
| *B.A in Theoretical Economics* | *2005 – 2010* |

## Skills

**Programming:** Python, SQL, **Frameworks:** Pytorch, Tensorflow, **Software:** ArcGIS Pro, QGIS, Stata, EViews, Adobe Creative Cloud, **Data analysis:** Geospatial, Panel Data, Time-series, ML-based modeling, Agent-Based Modeling

## Select Media Coverage

**MIT News Spotlight**, "Where the sidewalk ends?", Featured, March 2023.

**StreetsBlog USA**, "New Tool Maps Sidewalks From the Sky" Interview, March 2023.

**Planetizen**, "Mapping Sidewalks for Improved Connectivity", Featured, March 2023.

## Selected Publications

### Journal Articles

**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.*

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*

**Hosseini, M.**, Miranda, F., Lin, J., and Silva, C. (2022). Citysurfaces: City-scale semantic segmentation of sidewalks surfaces. *Sustainable Cities and Society, 79, 103630*

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*

### 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*

**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.*

Miranda, F., **Hosseini, M.**, Lage, M., Doraiswamy, H., Dove, G., Silva, C. (2020). Urban Mosaic: Visual Exploration of Streetscapes Using Large-Scale Image Data, In *In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems.*

Barr, J., **Hosseini, M.**, Scheer, D. (2017). Simhattan: Growing the City from the Ground Up. In *SCE 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