

# Maryam Hosseini

77 Massachusetts Institute of Technology, 10-402 – Cambridge, MA 02139  
✉ maryamh@mit.edu • 🌐 www.maryamhosseini.me • in maryam-r2-d2  
🔗 mary-h86

## Research Interests

---

Computer Vision, Built environment design and assessment, Computational geometry, Pedestrian mobility, Active mobility, Accessibility for people with disabilities, Walkability

## Research Experience

---

### MIT Department of Urban Studies and Planning

Cambridge, MA

*Postdoctoral Associate*

*Dec. 2022 – Present*

- Led *Sidewalk Ballet* project, a collaborative project to study the drivers of social activities in public spaces funded by Haaso Planter Institute (HPI) Germany, under “Designing for Sustainability” Program
- Led a collaborative proposal valued at \$1.2MM for the National Science Foundation (NSF) within three weeks of joining the team.
- Managed the public release and ongoing enhancements of the Tile2Net tool, resulting in engagement from various cities globally.
- Initiated and spearheaded the creation of standards for defining sidewalk topology, ensuring consistency and precision in future projects and developments.
- Engineered efficient algorithmic approaches to correct the topology and connectivity of sidewalk networks, enhancing the overall system performance and efficiency.
- Lead the network generation and analysis for multiple ongoing projects in the lab.

### Rutgers Department of Social Work

New Brunswick, NJ

*Research Consultant*

*2022 – Present*

- Led “Detecting human-interpretable features from satellite imagery for poverty mapping”, 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.

### NYU Computer Science Department

Brooklyn, NY

*Research Associate*

*Sep. 2018 – Dec. 2022*

- Created the first open-source Python-based tool for sidewalk network generation from aerial imagery. Published in *Computers Environment and Urban Systems* journal.
- Developed CitySurfaces, the first open-source model for semantic segmentation of sidewalk surface materials from street-level images, critical for UHI computation, stormwater management, and accessibility.
- Led the ‘Beyond the Horizon’ project with NEC, researching the potential of intelligent stationary infrastructure coupled with wireless capabilities for city safety.
- Interviewed summer interns for StreetAware project, collecting video data from diverse street intersections for pedestrian safety analysis.
- Contributed to three NSF and one NASA grant proposals and led two C2MART grants.

### Rutgers Department of Economics

Newark, NJ

*Graduate Research Assistant*

*2016 – 2018*

- Developed an agent-based model in Python to simulate New York City’s real estate market and analyzed the impact of various policies such as zoning, rent control and urban growth boundaries on real estate pricing and people’s choice of place
- Assisted with an NSF funded project on poverty and social mobility in Brazil. Performed statistical analysis of a large, unstructured survey data from Rio.

## Education

---

<b>Rutgers University</b> <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>	<b>US</b> 2016 – 2022
<b>University of Warsaw</b> <i>M.A in International Economics</i>	<b>Poland</b> 2011 – 2013
<b>University of Tehran</b> <i>B.A in Theoretical Economics</i>	<b>Iran</b> 2005 – 2010

## Awarded Grants

---

<b>Improving Food Aid Distribution with Trustworthy Multimodal Poverty Prediction</b> <i>Ideation, CASS Seed Grant in Cyberinfrastructure &amp; AI for Science and Society</i>	<b>Rutgers</b> 2023–2024
<b>Detecting Features from Satellite Imagery for Poverty Mapping</b> <i>Co-Investigator, The Office for the Vice Provost for Research's ML/AI Pilot Seed Grant</i>	<b>Rutgers</b> 2023

## Grant-writing Experience

---

<b>NSF HNDS-I</b> <i>Designed structure and led the writing and coordination of the proposal</i>	<b>MIT</b> 2023
<b>NSF CCSI</b> <i>Wrote education plan, use cases, and data management plan</i>	<b>NYU</b> 2022
<b>C2SMART</b> <i>Main lead in writing and ideation</i>	<b>NYU</b> 2021
<b>NASA SciAct</b> <i>Led the coordination between three involving institutions</i>	<b>NYU</b> 2021
<b>NSF CCSI</b> <i>Wrote education plan and use cases</i>	<b>NYU</b> 2020
<b>C2SMART</b> <i>Main lead in writing and ideation</i>	<b>NYU</b> 2020

## Skills

---

**Programming:** Python, Java Script (basic), SQL; **Computer Vision:** Pytorch, Tensorflow; **Software:** ArcGIS Pro, Adobe Creative Cloud (Photoshop, Illustrator, Fresco, LightRoom); **Data analysis:** Geospatial, Timeseries, Agent-Based Modeling, Google Cloud Computing

## 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*

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.

**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*

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 *Proceedings of the 24th International ACM SIGACCESS Conference on Computers and Accessibility*.

**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). Teardowns: An Agent-Based Model. In *Eastern Economic Association*

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

## Honors and Awards

---

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.

## Services

---

Co-organizer of the first workshop on urban accessibility at ASSETS'22 conference

Co-organizer of 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; The Visual Computer (TVCJ); ACM Conference on Human Factors in Computing Systems (CHI); IEEE Visualization; ACM ASSETS; Computers, Environment and Urban Systems; Cities; Transportation Research Board (TRB)