

# ARMITA KAR

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## Education

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### Ph.D. in Geography

July 2023

The Ohio State University, OH, USA

Dissertation: *Inclusive Accessibility: Integrating person-based hard and soft constraints into transportation planning.*

Committee: Harvey J. Miller (Co-Chair), Huyen T.K. Le (Co-Chair), Ningchuan Xiao, Andre Carrel, and Srinivasan Parthasarathy

### Master of Science in Geography

May 2019

The University of Utah, UT, USA

Thesis: *Vehicular Route Modelling for safe evacuation during Tropical Storms and Flooding.*

Advisor: Thomas J. Cova

### Bachelor of Urban and Regional Planning

September 2015

Bangladesh University of Engineering and Technology, Dhaka, Bangladesh

Thesis: *Modelling and Analyzing Land Use Dynamics: A Case Study of Dhaka City Corporation.*

Advisor: Sarwar Jahan

## Research Experience

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### Post Doctoral Research Scientist

August 2023 -

Center for Injury Research and Policy, Abigail Wexner Research Institute at Nationwide Children's Hospital (AWRINCH), OH, USA

Project title: *R01-Intervention to improve driving practices among high-risk teen drivers*

PI: Ginger Yang

Funded by: National Institutes of Health (NIH) - The Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

### Graduate Research Assistant

August 2022 – Aug 2023

Center for Urban and Regional Analysis (CURA), The Ohio State University, OH, USA

Project title: *Built environment influences on reckless driving behavior*

PI: Harvey J. Miller and Ginger Yang (Nationwide Children's Hospital, Columbus, Ohio)

Funded by: Translational Data Analytics Institute (TDAI) at The OSU

### Graduate Research Assistant

May 2021 – August 2022

Department of Geography, The Ohio State University, OH, USA

Project: *Estimating exposure and health impacts of traffic-related air pollution during daily travel*

PI: Huyen TK Le

Funded by: Sustainability Institute Pilot Grant, Translational Data Analytics Institute Pilot grant.

**GIS Research Assistant**

May 2018 – July 2018

The DIGIT Lab, University of Utah, UT, USA

Project: *Producing military standard map series for military training around the world*

Supervisor: Phoebe B. Mcneally

Funded by: Rockwell Collins, Inc.

## Teaching and Professional Experience

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**Guest Lecturer**

November 2022

Department of Geography, The Ohio State University, OH, USA

Course: Our Global Environment ([GEOG 2800](#))

**Guest Lecturer**

March 2022

Department of Geography, The Ohio State University, OH, USA

Course: Emerging Topics in GIS ([GEOG 5229](#))

**Graduate Teaching Assistant**

August 2020 – May 2021

Department of Geography, The Ohio State University, OH, USA

Courses: Introductory Spatial Data Analysis ([GEOG 4103](#)) and Cartography and Map Design ([GEOG 5200](#))

**Graduate Teaching Assistant**

August 2017 – May 2019

Department of Geography, The University of Utah, UT, USA

Courses: Intro to GIS ([GEOG 3100](#)), Intro to Geo-Programming ([GEOG 1180](#)), Geographical Analysis ([GEOG 3020](#)), and World Regional Geography ([GEOG 1300](#))

**Lecturer**

October 2015 – August 2017

Department of Urban and Regional Planning, Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

Courses: GIS and Remote Sensing, Urban Planning Techniques, Site and Area Planning, Presentation and Communication Techniques Studio, Project Evaluation and Management

## Publications

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### Peer-reviewed Journal Articles

- [8] Kar, A., Le, H. T., & Miller, H. J. (2023). Inclusive accessibility: Integrating heterogeneous user mobility perceptions into space-time prisms. *Annals of the American Association of Geographers*.
- [7] Liu, L., Kar, A., Tokey, A. I., Le, H. T. & Miller, H. J. (2023). Disparities in public transit accessibility and usage by people with mobility disabilities: An evaluation using high-resolution transit data. *Journal of Transport Geography*, 109, 103589. <https://doi.org/10.1016/j.jtrangeo.2023.103589>.

- [6] **Kar, A.**, Carrel, A. L., Miller, H. J., & Le, H. T. (2022). Public transit cuts during COVID-19 compound social vulnerability in 22 US cities. *Transportation Research Part D: Transport and Environment*, 110, 103435. <https://doi.org/10.1016/j.trd.2022.103435>.
- [5] **Kar, A.**, Le, H. T., & Miller, H. J. (2022). What is essential travel? Socioeconomic differences in travel demand in Columbus, Ohio, during the COVID-19 lockdown. *Annals of the American Association of Geographers*, 112:4, 1023-1046. DOI: 10.1080/24694452.2021.1956876.
- [4] **Kar, A.**, Motoyama, Y., Carrel, A. L., Miller, H. J., & Le, H. T. (2021). COVID-19 exacerbates unequal food access. *Applied Geography*, 134, 102517. <https://doi.org/10.1016/j.apgeog.2021.102517>.
- [3] Stiles, J., **Kar, A.**, Lee, J., Miller, H. J. (2021). Lower volumes, higher speeds: Changes to crash type, timing, and severity on urban roads from COVID-19 stay-at-home policies. *Transportation Research Record*. <https://doi.org/10.1177/03611981211044454>
- [2] **Kar, A.**, Wan, N., Cova, T.J., Wang, H., & Lizotte, S. L. (2021). Using GIS to understand the influence of hurricane Harvey on spatial access to primary care. *Risk Analysis*. <https://doi.org/10.1111/risa.13806>
- [1] Mahmud, S., Huq, M. E., **Kar, A.**, Mashraky, R., Khatun, F., Islam, I., & Akther, M. S. (2014). Managing development of fringe areas in Dhaka City: Land Readjustment as a technique for sustainable future development ensuring environmental and social justice. *International Journal of Undergraduate Research and Creative Activities*, 6(2), 5.

### **Manuscripts under Review**

- [1] **Kar, A.**, Xiao, N., Miller, H. J. & Le, H. T. (under review). Inclusive Accessibility: Translating person-based mobility perceptions into aggregated accessibility measures. *Computers, Environment and Urban Systems*.

### **Manuscripts in Progress**

- [3] **Kar, A.**, Le, H. T., Miller, H. J. & Xiao, N. Inclusive sidewalk planning with perceived constraints: A multi-objective optimization approach. (*Scheduled submission: October 2023 to International Journal of Geographical Information Science. Draft available upon request*).
- [2] **Kar, A.**, Ahmed, A., May, A., & Le, H. T. Spatio-temporal modeling of PM2.5 concentration based on land use and human activity pattern. (*Scheduled submission: October 2023 to Environmental Science & Technology. Draft available upon request*).
- [1] **Kar, A.**, Miller, H. J., Alshaikh, E., Hall, N., Recker, R. & Yang, J. Road design and visual environment induce the risky speeding behaviors of teen drivers. (*Scheduled submission: November 2023 to Accident Analysis & Prevention*).

### **Non-peer Reviewed Articles**

- [3] **Kar, A.**, Liu, L., Lin, Y. & Xiao, N. (July 23, 2020). Exploring the spatio-temporal dynamics of socio-economic dimensions of the COVID-19 pandemic: An interactive dashboard approach. URL: <https://u.osu.edu/geographyblog/2020/07/23/exploring-spatio-temporal-dynamics/>
- [2] **Kar, A.**, Mashraky, R., Khatun, F., Huq, M. E., Mahmud, S., Islam, I., & Akther, M. S. (2016). Prospects of urban regeneration in Motijheel commercial area of Dhaka City. *Imperial Journal of Interdisciplinary Research (IJIR)*, Vol-2, Issue-10, pg 1435-1444.

- [1] **Kar, A.** & Mashraky, R. (2016). Trends in pro-poor growth and inequality from the perspective of Bangladesh. *Nogor Shoilee, Vol-7*, ISBN-978984-333-9806-2.

## Conference Presentations

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- [12] **Kar, A.,** Le, H. T., Miller, H. J. & Xiao, N. (2023). An equity-oriented sidewalk planning approach using non-dominated sorting genetic algorithm. I-GUIDE Forum 2023 - Harnessing the Geospatial Data Revolution for Sustainability Solutions.
- [11] **Kar, A.,** Le, H. T. & Miller, H. J. (2023). Inclusive Accessibility: Redefining Urban Mobility from the Users' Perspectives. Annual Meeting of Transportation Research Board (TRB).
- [10] Liu, L., **Kar, A.,** Tokey, A. I., Le, H. T. & Miller, H. J. (2023). Disparities in public transit accessibility and usage by people with mobility disabilities: An evaluation using high-resolution transit data. Annual Meeting of Transportation Research Board (TRB).
- [9] **Kar, A.** (2022). Inclusive accessibility: Understanding the users' perspectives on public transit. Ohio Public Transit Association Conference (OPTA).
- [8] **Kar, A.,** Le, H. T. & Miller, H. J. (2022). Inclusive accessibility: A space-time framework integrating person-based hard and soft constraints. *Student lightning talks*. The University Consortium of Geographic Information Science (UCGIS) Symposium.
- [7] **Kar, A.,** Le, H. T. & Miller, H. J. (2022). Inclusive accessibility: A deep learning-based space-time framework integrating person-based hard and soft constraints. *GeoAI - Intelligent geospatial analytics*. Annual Meeting of the American Association of Geographers (AAG).
- [6] **Kar, A.,** Carrel, A. L., Miller, H. J., & Le, H. T. (2022). Reducing public transit compounds social vulnerabilities during COVID-19. *Transit, accessibility & vulnerability during the COVID-19 pandemic*. Annual Meeting of Transportation Research Board (TRB).
- [5] **Kar, A.,** Carrel, A. L., Miller, H. J., & Le, H. T. (2021). Reducing public transit compounds social vulnerabilities during COVID-19. The OSU Translational Data Analytics Institute (TDAI) fall forum.
- [4] **Kar, A.,** Carrel, A. L., Miller, H. J., & Le, H. T. (2021). Impacts of COVID-19 on public transit service and accessibility to food and health care in US cities. The University Consortium of Geographic Information Science (UCGIS) Symposium.
- [3] **Kar, A.,** Motoyama, Y., Carrel, A. L., Miller, H. J., & Le, H. T. (2021). Impact of COVID-19 on food shopping: A spatio-temporal analysis of changes in travel to supermarket and grocery stores. *Mobility changes and community impacts of COVID-19*. Annual Meeting of Transportation Research Board (TRB).
- [2] **Kar, A.,** Cova, T. (2020). Vehicular route modeling for safe evacuation during tropical storms and flooding. *Jeanne X. Kasperson student paper award*. Annual Meeting of the American Association of Geographers (AAG).
- [1] **Kar, A.,** Cova, T. (2019). Vehicular route modeling for safe evacuation during Tropical Storms and Flooding. *GIScience and hazards in the era of big data*. Annual Meeting of the American Association of Geographers (AAG).

## Invited Talks and Interviews

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- [4] **Kar, A.** (September 30, 2022). Online surveys and mobility tracking: Pros and cons of using the web. Talk presented at *Reports from the field*, Department of Geography, The Ohio State University.
- [3] **Kar, A.** (February 28, 2022). Socio-economic differences in travel demand in Columbus during COVID-19 lockdown. Talk presented at *Ohio - StreetLight User Group (SLUG)* meeting. <https://www.youtube.com/watch?v=DSiebgLo98k&t=326s>
- [2] **Kar, A.** (September 1, 2021). Pandemic made unequal access to food even worse, study suggests. Interview by *Spotlight on poverty & opportunity*. <https://spotlightonpoverty.org/spotlight-exclusives/pandemic-made-unequal-access-to-food-even-worse-study-suggests/>
- [1] **Kar, A.** Le, H. T. & Miller, H. J. (July 19, 2021). COVID heightened disparities in food access, Ohio State study finds. Radio interview by Evans, N. *WOSU 89.7 NPR News*. <https://news.wosu.org/coronavirus/2021-07-19/covid-heightened-disparities-in-food-access-ohio-state-study-finds>

## Media Coverage and Highlights

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- [7] Ohio State News (2021): [COVID-19 made unequal access to food worse, study suggests](#)
- [6] Ohio State News (2021): [Low-income people saw smallest drop in travel during COVID-19](#)
- [5] EurekAlert (2021): [Low-income people saw smallest drop in travel during COVID-19](#)
- [4] News Medical (2021): [Study finds more deadly auto crashes during pandemic lockdown](#)
- [3] WebMD (2021): [Pandemic Changed Grocery Shopping for Rich and Poor](#)
- [2] Science Daily (2021): [Deadly auto crashes more likely during pandemic lockdown](#)
- [1] Prothom Alo (2021): [People with low income saw smallest drop in travel during pandemic](#)

## Grants and Fellowships

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<b>The Rayner Scholarship for Fieldwork</b> Department of Geography, The Ohio State University Amount received \$3,500	Spring 2022
<b>The E. Willard and Ruby S. Miller Scholarship</b> Department of Geography, The Ohio State University Amount received \$4,000	Spring 2022
<b>Student Dissertation Award</b> Sustainability Institute, The Ohio State University Amount received \$5,000	Spring 2021
<b>One-year Graduate Student Fellowship Award</b> Graduate School, The Ohio State University Amount received \$26,000	2019 - 2020

## Awards

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<b>Best student lightning talk</b> , University Consortium for Geographic Information Science (UCGIS) Symposium, Syracuse, New York	2022
<b>Jeanne X. Kaspersen Student Paper Award</b> , Hazards, Risks, and Disasters Specialty Group, American Association of Geographers (AAG).	2020
<b>Prime Minister Gold Medal</b> , the University Grant Commission of Bangladesh.	2015
<b>Best Undergrad Thesis Award</b> , Department of Urban and Regional Planning, Bangladesh University of Engineering and Technology (BUET)	2015
<b>Dean's List Award</b> for securing 1 <sup>st</sup> position in the class, Bangladesh University of Engineering and Technology (BUET).	2012 - 2015

## Service

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<b>Journal Reviewer</b>	2020 -
<ul style="list-style-type: none"> <li>- Annals of the American Association of Geographers</li> <li>- Cities</li> <li>- Environment and Planning B: Urban Analytics and City Science</li> <li>- Transportation Safety and Environment</li> <li>- Health and Place</li> <li>- BMC Public Health</li> <li>- Computational Urban Science</li> <li>- Humanities and Social Sciences Communications</li> <li>- Transportation Research Board (TRB),</li> <li>- International Journal of Digital Earth</li> <li>- Bridging Transportation Research (BTR) conference</li> <li>- Journal of Bangladesh Institute of Planners.</li> </ul>	
<b>Organizer</b> , GISalon webinars, a platform for knowledge sharing and networking, hosted by GISphere, and supported by AAG Geographic Information Science and Systems Specialty Group (GISS), Cartography and Geographic Information Society (CaGIS), and Chinese Professional in Geographic Information Systems (CPGIS)	2023 -
<b>Volunteer</b> , Project Sidewalk, A community for identifying and mapping sidewalk accessibility issues in Columbus using Google Street View images.	2021 -
<b>Contributor</b> , An interactive COVID-19 dashboard, a voluntary project led by Dr. Ningchuan Xiao on behalf of the OSU Department of Geography <a href="https://geog-gis.asc.ohio-state.edu/COVID19-Dashboard/">https://geog-gis.asc.ohio-state.edu/COVID19-Dashboard/</a>	2020
<b>Member</b> , Women Are Creating Knowledge (WACK) (women graduate student professional development organization), Department of Geography, The Ohio State University	2019 -
<b>Vice President</b> , Bangladesh Student Association, University of Utah (BSAUU).	2018 - 2019
<b>Cultural Secretary</b> , Urban and Regional Planning (URP) Students Association of BUET (USAB).	2014-2015

## Professional Affiliations

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- American Association of Geographers (AAG)
- Transportation Research Board (TRB)
- University Consortium for Geographic Information Science (UCGIS)
- Cartography and Geographic Information Society (CaGIS)
- GISphere Guide
- Bangladesh Institute of Planners (BIP)

## Technical Skills

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Programming Skills	Python, R Programming, NetLogo, HTML, Javascript
GIS Skills	ArcGIS Desktop, ArcGIS Pro, ArcGIS Online, WebGIS, IDRISI, Erdas Imagine
Other Software Skill	Autocad, SPSS, MS Project, Adobe Illustrator
Methods	<b>Machine learning:</b> Random forest, support vector machine, logistic regression, neural networks, and few-shot learning techniques. <b>Statistical models:</b> Bayesian hierarchical logistic regression model, multilevel binary logistic model, and Hurdle model. <b>Spatial and space-time analytics:</b> Spatially weighted interaction models, Space-time regression kriging, Space-time accessibility. <b>Network analytics and Optimization.</b> <b>Data collection methods:</b> Online and smartphone app-based survey, GPS tracking, big data.