

TAKAHIRO YABE

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EDUCATION

- Doctor of Philosophy (PhD), Purdue University** 2021
Dissertation: *Resilience of Coupled Urban Socio-Physical Systems to Disasters*
Advisors: Satish V. Ukkusuri, Seungyoon Lee, P. Suresh C. Rao, David R. Johnson
- Master's Degree in Civil Engineering, University of Tokyo** 2017
Dissertation: *Modelling Evacuation Behavior after Disasters using Mobile Phone Data*
Advisors: Yoshihide Sekimoto, Muneo Hori
- Bachelor of Engineering, University of Tokyo** 2015
Dissertation: *Real-Time Urban Mobility Predictions via Particle Filter Approach*
Advisor: Yoshihide Sekimoto

RESEARCH INTERESTS

Resilience of Complex Urban Systems

- Modeling the interplay between social systems, built environment, and economic networks to understand the equity and resilience of cities to external shocks and societal changes.

Human Behavioral Data Science

- Applied statistics and data science methods to model individual human behavior and collective social network dynamics using big data (e.g., mobile phone location, web search).

Geospatial Artificial Intelligence for Urban Science

- Deep learning-based methods to understand urban functionality, urban hierarchical structures, and transferability of insights across cities using human behavioral data.

RESEARCH EXPERIENCE

- Postdoctoral Associate** 9/2021 – Present
MIT Institute for Data, Systems, and Society and Media Lab Boston, MA
- Mentored by Alex 'Sandy' Pentland. Leading research on urban sociotechnical systems resilience, including 1) urban segregation dynamics during the pandemic, 2) modeling the resilience of local economic networks to urban shocks (disasters and pandemics), which led to 2 papers (under review).
 - Bridging research collaborations between MIT Human Dynamics Group and industry sponsors.
- Doctoral Research Fellow & Research Assistant** 8/2017 – 8/2021
Purdue Systems Collaboratory, Purdue University West Lafayette, IN
- Research on the resilience of cities to disasters have resulted in over 20 publications, 2 fellowships and 10 awards, including the Doctoral "Systems" Fellowship and Best Speaker Award at Purdue University.
 - Student lead in the NSF funded project "*CRISP Type 2: Critical Transitions in the Resilience and Recovery of Interdependent Social and Physical Networks*" (PI: Dr. Satish V. Ukkusuri) and "Resilience Modeling in Cities" Project funded by the Ford Foundation, which have resulted in publications in top journals including the *Proceedings of the National Academy of Sciences*, *Nature Machine Intelligence*, and *ACM KDD*.

Research Assistant

4/2014 – 3/2017

University of Tokyo

Tokyo, Japan

- Developed data assimilation framework to integrate multi-agent simulations and real time observation data to predict city-scale human mobility with Dr. Shibasaki and Dr. Sekimoto.
- Delivered evacuation mobility analysis results using mobile phone location data to local governments just after Kumamoto earthquake (2016 April) to assist developing shelter allocation strategies.

INDUSTRY EXPERIENCE

Research Collaborator

3/2021 – Present

CrisisReady (Harvard-based NGO for data-driven disaster response)

Boston, MA

- Co-organized and acted as rapporteur for the Harvard Radcliffe Seminar Series held in March and April 2021, with nearly 40 technologists, scientists, lawyers and humanitarian responders from around the world.
- Co-organized workshop in Mexico City with local government to set up data-policy pipeline.

Data Science Consultant

5/2020 – 6/2022

The World Bank

Washington D.C.

- Developed open-source codes and tools to analyze population displacement and recovery patterns (<https://github.com/gfdrr/mobilkit>). Planned and provided tutorials and capacity building sessions for World Bank Group staff on location data analytics for disaster resilience.
- Conducted analysis and produced map visualizations of transport accessibility using geospatial data (CDR, OpenStreetMap, satellite imagery) in Maputo, Mozambique. Delivered working papers on accessibility analysis for transportation investments in Chennai, India.

Research Consultant

5/2020 – 7/2020

Asian Development Bank Institute

Tokyo, Japan

- Co-organized the *Purdue – ADBI – UTokyo virtual workshop* on “Resilient Cities” (>100 participants).
- Co-authored a policy brief paper related to urban mobility patterns during COVID-19 and public policy.

GRANTS AND FELLOWSHIPS

Quick Response Research Grant

2022

Natural Hazards Center, for analysis of wildfire response in California (seed grant of \$5,000)

MIT Sloan Latin America Office Seed Grant

2021

MIT Sloan School of Management, for research on economic resilience during pandemic, \$20,000

NSF Innovation Corps Grant

2019

Midwest I-Corps Industry Connect, for customer research on ride-sharing industry, \$1,000

Doctoral “Systems” Fellowship

2018 – 2020

Purdue Systems Collaboratory, full PhD funding & stipend for 2 years

Ford-Purdue University Alliance Project Grant (PI: Dr. Satish Ukkusuri)

2018

Ford Motor Company, for research in transportation resilience, \$130,000

Research Fellowship for Young Scientists (JSPS DC1)

2017

Japan Society for the Promotion of Science, full PhD stipend for 3 years (*declined due to joining Purdue*)**Doctoral Student Research Fellowship**

2016

Department of Engineering, University of Tokyo, for doctoral research preparation, \$3,000

Student Travel Grant for Overseas Study

2016

Department of Engineering, University of Tokyo, for visiting top US universities, \$4,000

HONORS AND AWARDS

Vice Presidential Unit Award World Bank, for data-driven humanitarian response efforts in Ukraine	2022
Top 10% Citation Award PloS ONE, for “ <i>Cross-comparative analysis of evacuation behavior after earthquakes using mobile phone data</i> ”	2021
Top Paper Award National Communication Association, for interdisciplinary study on community resilience	2021
STV Civil Engineering Graduate Assistantship Endowment Award Purdue University, for PhD dissertation	2020
ACM KDD 2020 Conference Student Registration Award	2020
UJA Best Presenter Award Japan XR Science Forum 2020, for best presentation in conference	2020
EISG Student Merit Award Finalist Engineering and Infrastructure Specialty Group, Society for Risk Analysis	2019
Society for Risk Analysis 2019 Annual Meeting Travel Award	2019
ACM SIGSPATIAL Conference 2019 Student Travel Award	2019
Poster Competition 2nd Prize The main conference on the scientific analysis of mobile phone datasets (NetMob 2019)	2019
Outstanding Speaker Award Purdue Institute of Transportation Engineers (ITE), for best presented in graduate school program	2019
Best Presentation Award Annual Conference of GIS Association of Japan, for best talk in national conference	2016

TEACHING EXPERIENCE

Guest Expert: “Big Data for Cities”, Northeastern University	2022
<ul style="list-style-type: none">▪ Guest expert invited by Professor Dan O’Brien at Northeastern University.▪ Led interactive discussion session with 22 Master students majoring in Political Science on the use of data for public policy, mainly for combatting urban economic segregation.	
Course Development: “Computational Methods for Urban Resilience”, Purdue	2021
<ul style="list-style-type: none">▪ Designed outline of lectures and preparation of course material including problem sets and lecture slides.▪ Could not teach course due to graduation, but gained course design and development experience.▪ Covers i) resilience concepts, ii) big data analytics, and iii) system dynamics modeling.	
Guest Lecturer: “Ecological Sciences and Engineering Colloquium”, Purdue CE597	2020
<ul style="list-style-type: none">▪ Gave a lecture on human mobility analysis during and after natural hazards for Master and PhD students in ecological sciences, invited by Professor P. Suresh C. Rao.▪ Created and assigned hands-on quantitative exercise on understanding and fitting probability density functions to empirical data using Python and R programming.	
Guest Lecturer: “Disaster Resilience”, Purdue HONR 399	2019
<ul style="list-style-type: none">▪ Gave a lecture on methods and techniques to model human mobility and behavior using large scale location datasets to undergraduate honors students, invited by Dr. Satish V. Ukkusuri.▪ Interactive Q&A and consultation session with students for deciding course projects.	

- Guest Lecturer: “Disaster Resilience and Society”, Purdue CE497** 2019
- Gave a lecture on evacuation modeling and analysis using household survey data and big data sources to undergraduate and graduate students, invited by Dr. Seungyoon Lee.
- Main Instructor: “Python Programming and Spatial Analysis”, University of Tokyo** 2016
- Created and taught a full semester course on the basics of Python programming and its applications in analysis of geospatial data. Developed all course material including python tutorials, lecture presentations, and hands-on exercises with examples.
- Teacher: English Courses, Sundai Preparatory School** 2011 – 2015
- Taught junior high school students English, Math, and Physics to prepare for their college entrance exams. Typical class sizes were 5~15. Designed lectures using the course material given by the school.

MENTORSHIP

PhD Students

- Isabella Loaiza Saa, MIT 2022 –
- Jiawei Xue, Purdue University 2021 –
- Sangung Park, Purdue University 2020 – 2021
- Rajat Verma, Purdue University 2020 – 2021
- Shagun Mittal, Purdue University 2020 – 2021
- ‘Mobility Data for COVID-19 Pandemic’ Team at Purdue University 2020 – 2021
 - 8 students (4 PhD, 2 MS, 2 BS) working on problems in behavior modeling, and social inequality.

Master Students

- Agnese Sacchi, MIT / ETH Zurich 2022 –
- Jiawei Xue, Purdue University (currently PhD student) 2020 – 2021
- Shagun Mittal, Purdue University (currently PhD student) 2019 – 2020

Undergraduate Students

- Eva Then, MIT 2022 –
- Chengyuan Yang, Purdue University (now at Cornell University) 2020 – 2021
- Daniel Hooks, Purdue University 2018 – 2021

SERVICE

Workshop Organization:

- **International Workshop on Data-Driven Humanitarian Mapping** at ACM KDD
 - Co-organizer and Digital Participation and Diversity Chair: 2021 (virtual), 2022 (Washington D.C.)
- **International Workshop on Prediction of Human Mobility** at ACM SIGSPATIAL
 - Steering Committee Member: 2017 (LA), 2018 (Seattle), 2019 (Chicago)
- **Purdue – ABDI – UTokyo Virtual Workshop on Resilience of Cities**
 - Assistant Organizer managing >100 attendees and 15 talks; virtual (October 2020);

Professional Organizations:

- Transportation Research Board AMR20 Disaster Response, Emergency Evacuation, Business Continuity
- Association for Computing Machinery (ACM) Special Interest Group on Spatial Information (SIGSPATIAL)
- ACM Special Interest Group on Knowledge Discovery and Data Mining (SIGKDD)

Student Organizations:

- **Event Coordinator** of *Purdue Institute of Transportation Engineers (ITE) Student Chapter* (2018 – 2019)
- **Student Member** of *Indy Tomorrow*, a network of Japanese researchers in the Midwest. (2019 – 2021)

Reviewer for Journals / Conferences:

- **Interdisciplinary:** Scientific Reports; PLoS ONE; Humanities and Social Sciences Communications
- **Computer Science & Data Science:** AAAI; ACM SIGSPATIAL; ACM KDD; The Webconf
- **Transportation Engineering and Civil Engineering:** Transportation Research Parts C, D, and E; Transportation Research Record; Frontiers in Future Transportation; Journal of Infrastructure Systems
- **Urban Planning and GIScience:** Sustainable Cities and Society; Computers, Environment, and Urban Systems; International Journal of Disaster Risk Reduction; Environment and Planning B: Urban Analytics and City Science; Frontiers in Built Environment; Geospatial Information Science
- **Public Health:** Lancet Public Health; BMC Public Health; Journal of Health Policy and Management

PUBLICATIONS

equal contribution

† Master and PhD students I mentored

Articles in Peer Reviewed Journals:

- [J22] **Yabe, T.**, Rao, P. S. C., Ukkusuri, S. V., & Cutter, S. L. Towards Data-Driven, Dynamical Complex Systems Approaches to Disaster Resilience. *Proceedings of the National Academy of Sciences*, 119(8), e2111997119. (2022)
- [J21] **Yabe, T.**, Jones, N. K., Rao, P. S. C., Gonzalez, M. C., & Ukkusuri, S. V. Mobile Phone Location Data for Disasters: A Review from Natural Hazards and Epidemics. *Computers, Environment, and Urban Systems*, 94, 101777. (2022)
- [J20] **Yabe, T.**, Tsubouchi, K., Sekimoto, Y., & Ukkusuri, S. V. Early warning of COVID-19 hotspots using human mobility and web search query data. *Computers, Environment and Urban Systems*, 92, 101747. (2022).
- [J19] Mittal, S.†, **Yabe, T.**, Arroyo, F., & Ukkusuri, S. V. Linking Poverty-Based Inequalities with Transportation and Accessibility using Mobility Data: A Case Study of Greater Maputo. *Transport Research Record*. (2022)
- [J18] Xue, J.†, Jiang, N., Liang, S., Pang, Q., **Yabe, T.**, Ukkusuri, S. V., & Ma, J. Quantifying spatial homogeneity of urban road networks via graph neural networks. *Nature Machine Intelligence*, 4(3), 246–257. (2022)
- [J17] Lee, S., Siebeneck, L., Benedict, B. C., **Yabe, T.**, Jarvis, C. M. & Ukkusuri, S. V. Patterns of social support and trajectories of household recovery after Superstorm Sandy. *Natural Hazards Review*, 23(2), 04022002. (2022)
- [J16] **Yabe, T.**, Rao, P. S. C., & Ukkusuri, S. V. Resilience of Interdependent Urban Socio-Physical Systems using Large-Scale Mobility Data: Modeling Recovery Dynamics. *Sustainable Cities and Society*, 75, 103237. (2021).
- [J15] **Yabe, T.**, Rao, P. S. C., & Ukkusuri, S. V. Regional Differences in Resilience of Social and Physical Systems: Case Study of Hurricane Maria. *Environment and Planning B: Urban Analytics and City Science*, 48(5), 1042-1057. (2021)
- [J14] **Yabe, T.**, Rao, P. S. C., & Ukkusuri, S. V. Modeling the Influence of Online Social Media Information on Post-Disaster Mobility Decisions. *Sustainability*, 13(9), 5254. (2021).
- [J13] Verma, R.†, **Yabe, T.**, & Ukkusuri, S. V. Spatiotemporal contact density explains the disparity of COVID-19 spread in urban neighborhoods. *Scientific Reports*, 11(1), 1-11. (2021).
- [J12] **Yabe, T.**, Zhang, Y., & Ukkusuri, S. V. Quantifying the Economic Impact of Disasters on Businesses using Human Mobility Data: a Bayesian Causal Inference Approach. *EPJ Data Science*, 9(36). (2020)

- [J11] **Yabe, T.**, Tsubouchi, K., Fujiwara, N., Wada, T., Sekimoto, Y., & Ukkusuri, S. V. Non-compulsory measures sufficiently reduced human mobility in Tokyo during the COVID-19 epidemic. *Scientific Reports*, 10(1), 1-9. (2020)
- [J10] Ukkusuri, S. V., **Yabe, T.**, Seetharam, K. E. Non-Pharmaceutical Interventions for COVID-19: Evidence from Large-Scale Mobility Data in Tokyo. *Asian Development Bank Policy Brief*, 10(6). (2020)
- [J9] **Yabe, T.**, Tsubouchi, K., Fujiwara, N., Sekimoto, Y., Ukkusuri, S. V. Understanding post-disaster population recovery patterns. *Journal of the Royal Society Interface*, Vol. 17, Issue 163. (2020)
- [J8] **Yabe, T.**, Ukkusuri, S. V. Effects of Income Inequality on Evacuation, Reentry and Segregation after Disasters. *Transportation Research Part D: Transport and Environment*, 102260. (2020)
- [J7] Pang, Y., Kashiya, T., **Yabe, T.**, Sekimoto, Y., Tsubouchi, K. Development of a people mass movement simulation framework based on reinforcement learning. *Transportation Research Part C: Emerging Technologies*, 117, 102260. (2020)
- [J6] **Yabe, T.**, Ukkusuri, S. V., Rao, P. S. C. Mobile Phone Data Reveals the Importance of Inter-City Social Connectivity for Recovery after Hurricane Maria. *Applied Network Science*, Vol. 4, Issue 1, 98. (2019)
- [J5] **Yabe, T.**, Ukkusuri, S. V. Integrating Information from Heterogeneous Networks on Social Media to Predict Post-Disaster Returning Behavior. *Journal of Computational Science*, Vol. 32, pp. 12-20. (2019)
- [J4] **Yabe, T.**, Sekimoto, Y., Tsubouchi, K., Ikemoto, S. Cross-comparative analysis of evacuation behavior after earthquakes using mobile phone data. *PLoS ONE*, Vol. 14, Issue 2, e0211375 (2019)
- [J3] **Yabe, T.**, Tsubouchi, K., Sekimoto, Y. CityFlowFragility: Measuring the Fragility of People Flow in Cities to Disasters using GPS Data Collected from Smartphones. *ACM Interactive, Mobile, Wearable and Ubiquitous Technologies*, 1(3), 117. (2017)
- [J2] **Yabe, T.**, Tsubouchi, K., Sudo, A., Sekimoto, Y. Predicting Delay of Commuting Activities Following Frequently Occurring Disasters Using Location Data from Smartphones. *Journal of Disaster Research*, Vol. 12, No.2, pp. 287-295. (2017)
- [J1] **Yabe, T.**, Sekimoto, Y., Kashiya, T., Kanasugi, H., Sudo, A. Real time movement prediction after natural disasters using data assimilation. (in Japanese). *Journal of the Japanese Society for Transportation Engineering*, Vol. 2 No. 2, pp. 19-27. (2016)

Articles in Peer Reviewed Computer Science Conference Proceedings:

*Acceptance rate shown in brackets

KDD = ACM SIGKDD International Conference on Knowledge Discovery & Data Mining

SIGSPATIAL = ACM SIGSPATIAL Int'l Conference on Advances in Geographic Information Systems

- [C17] Xue, J.[†], **Yabe, T.**, Tsubouchi, K., Ma, J., & Ukkusuri, S. V. Multiwave COVID-19 Prediction from Social Awareness using Web Search and Mobility Data. *KDD '22*. pp. 4279-4289. (2022). (14%)
- [C16] Gaikwad, S., Iyer, S., Lunga, D., **Yabe, T.**, Liang, X., Ananthabhotla, B., Behari, N., Guggilam, S., & Chi, G. Data-driven Humanitarian Mapping and Policymaking: Toward Planetary-Scale Resilience, Equity, and Sustainability. *KDD '22*, pp 4872-4873 (2022) (invited paper for workshop)
- [C15] Shimizu, T., Tsubouchi, K., & **Yabe, T.** GEO-BLEU: Similarity Measure for Geospatial Sequences. *SIGSPATIAL '22*. (2022)
- [C14] Shimizu, T., **Yabe, T.**, & Tsubouchi, K. Improving Land Use Classification using Human Mobility-based Hierarchical Place Embeddings. *2021 IEEE International Conference on Pervasive Computing and Communications Workshops* pp. 305-311. (2021). (15%)
- [C13] **Yabe, T.**, Tsubouchi, K., Shimizu, T., Sekimoto, Y., Ukkusuri, S. V. Unsupervised Translation via Hierarchical Anchoring: Functional Mapping of Places across Cities. *KDD '20* (2020) (14%)

- [C12] Shimizu, T., **Yabe, T.**, Tsubouchi, K. Enabling Finer Grained Place Embeddings using Spatial Hierarchy from Human Mobility Trajectories. **SIGSPATIAL '20** (2020) (20%)
- [C11] Pang, Y., Tsubouchi, K., **Yabe, T.**, & Sekimoto, Y. Intercity Simulation of Human Mobility at Rare Events via Reinforcement Learning. **SIGSPATIAL '20** (2020). (20%)
- [C10] **Yabe, T.**, Tsubouchi, K., Shimizu, T., Sekimoto, Y., Ukkusuri, S. V. City2City: Translating Place Representations across Cities. **SIGSPATIAL '19** (2019) (21%)
- [C9] **Yabe, T.**, Tsubouchi, K., Shimizu, T., Sekimoto, Y., Ukkusuri, S. V. Predicting Evacuation Decisions using Representations of Individuals' Pre-Disaster Web Search Behavior. **KDD '19** (2019) (17%)
- [C8] **Yabe, T.**, Tsubouchi, K., Sekimoto, Y. Fusion of Terrain Information and Mobile Phone Location Data for Flood Area Detection in Rural Areas. **2018 IEEE Conference on Big Data**. (2018) (20%)
- [C7] Kumar, D., **Yabe, T.**, Ukkusuri, S.V. Social-Media aided Hyperlocal Help-Network Matching & Routing during Emergencies. **2018 IEEE Conference on Big Data**. (2018) (20%)
- [C6] Pang, Y., Tsubouchi, K., **Yabe, T.**, Sekimoto, Y. Replicating Urban Dynamics by Generating Human-like Agents from Smartphone GPS Data. **SIGSPATIAL '18**. (2018) (20%)
- [C5] Pang, Y., Tsubouchi, K., **Yabe, T.**, Sekimoto, Y. Modeling and reproducing human daily travel behavior from GPS data: A Markov Decision Process approach. **PredictGIS Workshop at SIGSPATIAL** (2017)
- [C4] **Yabe, T.**, Tsubouchi, K., Sudo, A., Sekimoto, Y. Predicting Irregular Individual Movement following Frequent Mid-Level Disasters using Location Data from Smartphones. **SIGSPATIAL '16**. (2016) (19%)
- [C3] **Yabe, T.**, Tsubouchi, K., Sudo, A., Sekimoto, Y. A Framework for Evacuation Hotspot Detection after Large Scale Disasters using Location Data from Smartphones: Case Study of Kumamoto Earthquake. **SIGSPATIAL '16** (2016) (19%)
- [C2] Sudo, A., Kashiyama, T., **Yabe, T.**, Kanasugi, H., Song, X., Higuchi, T., Nakano, S., Saito, M., Sekimoto, Y. Particle Filter for Real-time Human Mobility Prediction following Unprecedented Disaster. **SIGSPATIAL '16**. (2016) (19%)
- [C1] **Yabe, T.**, Sekimoto, Y., Kanasugi, Y., Kashiyama, T. Making Real-Time Predictions of People's Irregular Movement in a Metropolitan Scale under Disaster Situations. **14th International Conference on Computers in Urban Planning and Urban Management (CUPUM)**. (2015)

Articles under review and in preparation:

- [R7] **Yabe, T.**, Bueno, B.G.B., Dong, X., Pentland, A. S., Moro, E. Behavioral changes during the pandemic worsened income diversity of urban encounters. (under review 2nd round in *Nature Communications*)
- [R6] **Yabe, T.**, Bueno, B.G.B., Frank, M., Pentland, A. S., Moro, E. Effects of mobility-based dependency networks on economic resilience. (in preparation)
- [R5] Ubaldi, E.[#], **Yabe, T.**[#], Jones, N.K., Khan, M.F., Feliciotti, A., Di Clemente, R., Ukkusuri, S. V., & Strano, E. Mobilkit: A Python Toolkit for Resilient Urban Planning and Disaster Risk Management Analytics using Human Mobility Data. (under review in *Environmental Modeling and Software*)
- [R4] Fraser, T.[#], **Yabe, T.**[#], Aldrich, D., & Moro, E. The Great Equalizer? Mixed Effects of Social Infrastructure on Diverse Encounters in Cities. (in preparation)
- [R3] Mittal, S.[†], **Yabe, T.**, Kumar, I., & Ukkusuri, S. V. Cross-sectoral relationships in business entry dynamics around a highway corridor. (under review in *Transportmetrica A: Transport Science*).
- [R2] Park, S.[†], **Yabe, T.**, & Ukkusuri, S. V. Post-disaster recovery policy assessment of urban socio-physical systems (under review in *Computers, Environment, and Urban Systems*).
- [R1] Kashiyama, T., Pang, Y., Sekimoto, Y., & **Yabe, T.** Pseudo-PFLOW: Development of nationwide synthetic open dataset for people movement based on limited travel survey and open statistical data. (under review in *Scientific Data*).

Invited Talks and Seminars:

- [T17] “Effects of mobility-based dependency relationships on economic resilience.” Invited Talk at the *StatPhys4Cities Seminar* at Universitat Rovira i Virgili. September 2022
- [T16] “Resilience of Urban Complex Systems to Disasters: From Mobility Data Analytics to Systems Modeling.” Invited Talk at *One Concern Inc.* March 2022
- [T15] “Resilience of Urban Socio-Physical Systems.” Invited Talk at the *Resilience Lab Seminar* at Northeastern University. February 2022
- [T14] “COVID-19 Prediction using Human Mobility and Web Search Data.” Invited Talk at *Yahoo Japan Corporation Seminar Series*. December 2021
- [T13] “Resilience of Socioeconomic Systems.” Invited Talk at the *MIT Connection Science Research Initiative Annual Sponsors Meeting*. November 2021
- [T12] “Human Mobility Data and Disasters.” Invited Talk at the *Nethope Summit 2021* (with Andrew Schroeder, Alex Pompe, and Jennifer Chan). November 2021
- [T11] “Resilience of Urban Socioeconomic Systems: From Big Data Analytics to Dynamical Systems Modeling.” Invited Talk at the *Tohoku University Regional Science Workshop*. November 2021
- [T10] “Post-disaster population displacement and recovery analysis using human mobility data.” Invited Talk at the *Disaster Mobility Data Network*. August 2021
- [T9] “Resilience of Socioeconomic Systems: A Data-Driven Systems Dynamics Approach.” Invited Talk at the *Media Lab Human Dynamics Group, Massachusetts Institute of Technology*. April 2021
- [T8] “Resilience of Socioeconomic Systems: A Data-Driven Systems Dynamics Approach.” Invited Talk at the *School of Information Science and Technology, George Mason University*. April 2021
- [T7] “Resilience of Cities to Shocks.” Invited Talk at the *Senseable City Lab, Department of Urban Studies and Planning, Massachusetts Institute of Technology*. March 2021
- [T6] “Informing disaster management through human mobility data: a case study and toolkit.” Invited Seminar at *The World Bank Resilient Society Clinic*. March 2021
- [T5] “Quantifying the economic impact of disasters on businesses using human mobility data: a Bayesian causal inference approach”, Invited Talk at *Safegraph Inc. (virtual)*. February 2021.
- [T4] “Resilience of Coupled Urban Socio-Physical Systems: Data-Driven System Dynamics Approach”, Invited Talk at the Distinguished Seminar Series, *Department of Civil and Environmental Engineering at Northeastern University (virtual)*. January 2021.
- [T3] “Examining and Repairing Cities using Big Data”, Invited Talk at “*scienc-ome*” *Online Science Forum, Keio University (virtual)*. November 2020.
- [T2] “Mobility Data and Natural Disasters in Low- and Middle-Income Countries”; Invited Talk at *COVID-19 Mobility Data Network (virtual)*. November 2020.
- [T1] “How Can Cities Become More Resilient to Natural Disasters?”, Invited Talk at the *Purdue Systems Thinkers Colloquium, West Lafayette, Indiana, USA*. March 2020.

Conference Presentations (without proceedings):

- [P18] Long-term impacts of COVID-19 on urban income segregation. *NetSci 2022 (virtual)*. July 2022
- [P17] Effects of mobility-based dependency network on economic resilience. *NetSci 2022 (virtual)*. July 2022
- [P16] “Long-term impacts of COVID-19 on urban income segregation.” At *International Conference of Computational Social Science (IC2S2) 2022, Chicago, USA*. July 2022.
- [P15] “Effects of mobility-based dependency relationships on economic resilience.” *International Conference of Computational Social Science (IC2S2) 2022, Chicago, USA*. July 2022.

- [P14] “Location Data Reveals Disproportionate Disaster Impact Amongst the Poor: Case Study of the 2017 Puebla Earthquake Using Mobilkit.” *Data-driven Humanitarian Mapping Workshop 2021*. August 2021.
- [P13] “Mobilkit: A Python Toolkit for Urban Resilience and Disaster Risk Management Analytics using High Frequency Human Mobility Data.” *Data-driven Humanitarian Mapping Workshop 2021*. August 2021.
- [P12] “Regional Differences in Resilience of Social and Physical Systems: Case Study of Hurricane Maria”, *ADBI – Purdue University – University of Tokyo: Virtual Workshop on Resilience of Cities to External Shocks: Analysis, Modeling and Economic Impacts (virtual)*. October 2020.
- [P11] “The relationship between social contact reduction and COVID-19 spread using mobility data”, *Bridging Transportation Researchers Online Conference (virtual)*. August 2020.
- [P10] “Modeling the Dynamics of Spatial Segregation after Disasters using Mobile Phone Data”, *Transportation Research Board Annual Meeting, Washington D.C., USA*. January 2020.
- [P9] “Modeling the Influence of Online Social Media Information on Post-Disaster Mobility Decisions” (poster), *Transportation Research Board Annual Meeting, Washington D.C., USA*. January 2020.
- [P8] “Understanding Population Recovery Patterns after Disasters from Mobile Phone Data”, *Society for Risk Analysis Annual Meeting 2019, Arlington, Virginia, USA*. December 2019.
- [P7] “Critical Transitions in the Resilience and Recovery of Interdependent Social and Physical Networks”, *44th Annual Natural Hazards Workshop, Denver, Colorado, USA*. July 2019. **(Plenary talk)**
- [P6] “Understanding Post-Disaster Population Recovery Patterns” (poster presentation), *The main conference on the scientific analysis of mobile phone datasets (NetMob), Oxford, UK*. July 2019.
- [P5] “Mobile phone data reveals the importance of inter-city social connectivity for recovery after Hurricane Maria” (poster), *Complex Systems Conference, Purdue University, Indiana, USA*. May 2019.
- [P4] “Population Recovery Modeling with Mobile Phones”, *National Science Foundation CRISP Grantees Meeting, George Mason University, Virginia, USA*. December 2018.
- [P2] “A Framework for Evacuation Hotspot Detection after Large Scale Disasters using Mobile Phone Location Data”, *NetMob 2017, Milan, Italy*. April 2017.
- [P1] “Estimating Evacuation Hotspots using GPS data: What happened after large earthquakes in Kumamoto, Japan?”, *International Workshop on Urban Computing, San Francisco, USA*. August 2016.

MEDIA COVERAGE

- “Analysis of human mobility patterns during COVID-19 using smartphone location data”, *Kodomo no Kagaku* (Japanese science magazine for children), February 2021.
- “Self-restraint proves effective, while income inequality affects contact rates”, *Diamond Online*, November 9th, 2020.
- “Tokyo’s Voluntary Standstill May Have Stopped COVID-19 in its Tracks”, in multiple outlets including *BioNews Central*, *ScienceDaily*, *Medical Xpress*, *LatinAmerican Post*. November 5th, 2020.
- “Mobile phone data shows how Japan averted large-scale outbreaks of COVID-19”, *News Medical*, November 6th, 2020.
- “Life-saving information technology: Predicting disasters using IoT”, *Nikkei Newspaper (Industrial)*. August 25th, 2016.