SANGUNG PARK

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Gainesville, FL - 32607, USA

07/05/2025 Updated.

RESEARCH INTERESTS   KEYWORDS DIRECTLY RELATED TO THE POSITION ARE UNDERLINED.

• **Disaster science** and Large-scale human mobility data analysis,

• **Smart city**, Complex systems, System dynamics, and Agent-based models,

• **Transportation Planning**, and

• **Heatwave impacts in transportation systems**.

EDUCATION

• **Purdue University**   *Aug 2019 - Aug 2024*
Ph. D. in Lyles School of Civil Engineering   West Lafayette, US
  ◦ GPA: 3.72/4.00
  ◦ Dissertation title: Critical Transitions of Post-disaster Recovery via Data-driven Interdependent
    Socio-physical Multi-agent Systems
  ◦ Studied and worked at Urban Mobility Networks and Intelligence Lab with Dr. Satish V. Ukkusuri.

• **University of Seoul**   *Feb 2016 - Aug 2017*
M.S. in Transportation Engineering   Seoul, South Korea
  ◦ GPA: 4.38/4.50
  ◦ Thesis title: Traffic Flow Analysis under a Connected and Autonomous Environment through Market
    Penetration Rates
  ◦ Studied and worked at the Transportation Planning Lab with Dr. Seungjae Lee.

• **University of Seoul**   *Mar 2010 - Feb 2016*
B.S. in Transportation Engineering and Statistics   Seoul, South Korea
  ◦ GPA: 3.53/4.00
  ◦ Project title: Transit Scheduling of Subway No. 9 to Reduce Congestion

EXPERIENCE

• **University of Florida [🌐]**   *Aug 2024 - Current*
Postdoctoral Associate   Gainesville, USA
  ◦ Research at SERMOS lab advised by Dr. Xilei Zhao.
  ◦ Lead a project as a Principal Investigator, "Developing a Dynamic Social Vulnerability Index for Public
    Health" (Total $ 5,000).
  ◦ Support TSIS-CORSIM 3D visualization and marketing strategies at the McTrans Center.
  ◦ Advise students:
    * Graduate students: Thomas Florian Veit and Shangkun Jiang.
    * Undergraduate students: Ally Recalde and Matthew Mapa.

• **Seoul Institute [🌐]**   *Jul 2017 - Jun 2019*
Researcher   Seoul, South Korea
  ◦ Conduct several projects:
    * A Study on Efficient Operation of a Plan on a Special Transportation and Expansion of low-floor bus
    * A Study on an Improvement Plan on a Bicycle Environment
    * A Base Study on the Introduction of New Transportation to Improve Traffic Congestion and Vitalize
      Tourism
    * A Special Plan on the Green Transportation Promotion Area in Seoul.
    * A Base Study on the Restructuring of Gwanghwamun Square in Seoul.

SELECTED RESEARCH PROJECTS

- **A deep learning approach for detecting built environment in transit-oriented developments** *Aug 2024 - May 2025*
  Sponsor: UTC - Center for Equitable Transit Oriented Communities (CETOC) Role: Researcher

- **Developing a dynamic social vulnerability index (DSVI) for public health using location-based data in Hurricane Beryl ($5,000)** *Oct 2024 - Apr 2025*
  Sponsor: Public Health Extreme Events Research (PHEER) network Role: PI
  ◦ PI: Dr. Sangung Park

- **Analyzing transit-based evacuation demand in hurricanes** *Aug 2024 - May 2025*
  Sponsor: Center for Equitable Transit Oriented Communities (CETOC) Role: Researcher

- **Cybersecurity Testbed for Connected and Autonomous Vehicles (CAVs)** *Jan 2024 - May 2024*
  Sponsor: USDOT National Center for Transportation Cybersecurity and Resiliency (TraCR) Role: RA

- **Adapting Transport Systems for Future Heat Extremes** *Aug 2023 - Dec 2024*
  Sponsor: World Bank - Global Facility for Disaster Reduction and Recovery Role: RA

- **CRISP Type2: Critical Transitions in the Resilience and Recovery of Interdependent Social and Physical Networks** *Aug 2019 - Dec 2022*
  Sponsor: National Science Foundation Role: RA
  ◦ Collaborations with social science (Dr. Seungyoon and Dr. Laura Siebeneck) and electrical and computer engineering (Dr. Shreyas Sundaram).

- **A Study on Efficient Operation of a Plan on a Special Transportation and Expansion of low-floor bus.** *Jul 2018 - Jun 2019*
  Sponsor: Ministry of Land, Infrastructure and Transport, South Korea. Role: Researcher

- **A Study on an Improvement Plan on a Bicycle Environment.** *Jan 2018 - Dec 2018*
  Sponsor: Seoul Metropolitan Government, Seoul, South Korea. Role: Researcher

- **A Special Plan on the Green Transportation Promotion Area in Seoul.** *Jan 2018 - Dec 2018*
  Sponsor: Seoul Metropolitan Government, Seoul, South Korea. Role: Researcher

- **A Base Study on the Restructuring of Gwanghwamun Square in Seoul.** *Jul 2017 - Dec 2018*
  Sponsor: Seoul Metropolitan Government, Seoul, South Korea. Role: Researcher

- **A Study on the Autonomous Driving System Using Traffic Data-oriented Data Mining and V2X Communication Technologies.** *Jul 2015 - Jul 2017*
  Sponsor: National Research Foundation of Korea, South Korea. Role: RA

PUBLICATIONS
C=Conference, J=Journal, P=Preparation, S=In Submission, T=Thesis

[P.5] Lee, S., **Park, S.**, Benedict, B. The structure of institutional and emergent social support networks in long-term disaster recovery: A case of Hurricane Harvey. In Preparation.

[P.4] **Park, S.**, Zhao, X. Rodrigues, M., Sun, Y., and Eisenman, D. Identifying High-need Areas through Social Media and Power Outage Data in Hurricanes Helene and Milton. In Preparation.

[P.3] **Park, S.**, Sun, Y., Jiang, S., and Zhao, X. Developing a Dynamic Social Vulnerability Index for Public Health (DSVI-PH) Using Location-based Data in Hurricane Beryl. In Preparation.

[P.2] **Park, S.**, Ka, E., and Ukkusuri, S. V. Identifying Critical Transitions in Post-disaster Recovery through Mathematical Expressions of Multi-agent Systems. In Preparation.

[P.1] **Park, S.**, Xue, J., and Ukkusuri, S. V. Finding critical transitions of the post-disaster recovery using the sensitivity analysis of agent-based models. In Preparation.

[S.5] Mittal, S., **Park, S.**, Chester, M. V., Huber, M., Romero, N., Avner, P., Jones, N. K. W., Ukkusuri, S. V. Commuting in the Heat: A Comprehensive Review of Extreme Temperature Impacts on Transport Users, Behavioral Adaptations and Mitigation Strategies. Manuscript submitted for publication in *Sustainable Cities and Societies*. In review.

[S.4] Jiang, S., Zhang, X., Liang, Y., Wong, W., **Park, S.**, and Zhao, X. (2025). Examining the short-term causal impact of evacuation orders on traffic speed: Evidence from hurricane Ian. Manuscript submitted for publication in *Travel Behaviour and Society*. In review.

[S.3] Recalde, A., Liu, L., Zhang, X., **Park, S.**, and Zhao, X. (2024). Assessing Evacuation Destination Choices during Hurricane Ian: A Gravity Model Approach Using Mobile Device Location Data. Manuscript submitted for publication in *Transportation Research Part D: Transport and Environment*. In review.

[S.2] **Park, S.**, Benedict, B. C., Lee, S., Siebeneck, L., and Ukkusuri, S. V. (2024). Regional Heterogeneity of Evacuation and Return Processes in Hurricane Harvey. Manuscript submitted for publication in *International Journal of Disaster Risk Science*. In review.

[S.1] **Park, S.**, and Ukkusuri, S. V. (2024). Identifying Transferable County-level Regional Interdependence of the Post-disaster Recovery Process Using Causal Discovery. Manuscript submitted for publication in *Sustainability Analytics and Modeling*. In review.

[J.12] Xue, J., **Park, S.**, Mondal, W. U., Reia, S. M., Yao, T., and Ukkusuri, S. V. (2024). An agent-based model of post-disaster recovery in multilayer socio-physical networks. *Sustainable Cities and Society*, Vol. 115, pp. 105863. DOI: 10.1016/j.scs.2024.105863

[J.11] **Park, S.**, Yabe, T., and Ukkusuri, S. V. (2024). Post-disaster recovery policy assessment of urban socio-physical systems. *Computers, Environment, and Urban Systems*, Vol. 114, pp. 102184. DOI: 10.1016/j.compenvurbsys.2024.102184

[J.10] Ukkusuri, S. V., **Park, S.**, Mittal, S., Chapman, L., Manoli, G., Santos, A., Jones, N. K. W., Avner, P., Romero, N., et al. (2024). We need to prepare our transport systems for heatwaves—here's how. *Nature*, Vol. 632, Issue 8024, pp. 253-256. DOI: 10.1038/d41586-024-02538-8

[J.9] **Park, S.**, Kim, M., and Kim, J. (2024). Hourly Long-term Traffic Volume Prediction with Meteorological Information using Graph Convolutional Networks. *Applied Sciences*, Vol. 14, Issue 6, pp. 2285. DOI: 10.3390/app14062285.

[J.8] **Park, S.**, Yao, T., and Ukkusuri, S. V., (2024). Spatiotemporal Heterogeneity Reveals Urban-Rural Differences in Post-disaster Recovery. *npj Urban Sustainability*, Vol. 4, Issue 1, pp. 2. DOI: 10.1038/s42949-023-00139-4.

[J.7] **Park, S.** and Kim, J. (2023). Environmental Implications of Autonomous Demand Responsive Bus in Microscopic Traffic Simulation. *Chemical Engineering Transactions*, DOI: 10.3303/CET23106100.

[J.6] **Park, S.** and Kim, J. (2022). Impact Assessment of an Autonomous Demand Responsive Bus in a Microscopic Traffic Simulation. *The Journal of the Korea Institute of Intelligent Transport Systems*, Vol. 21, Issue 6, pp. 70-86. DOI: 10.12815/kits.2022.21.6.70.

[J.5] Kim, J., **Park, S.**, Kim, K., Lee, S. (2019). Environmental Implications on Energy and Emissions of the use of a Connected and Autonomous Vehicle Environment. *Chemical Engineering Transactions*, Vol. 72, pp. 97-102. DOI: 10.3303/CET1972017.

[J.4] Lee, S., Heydecker, B. G., Kim, J., and **Park, S**. (2018). Stability analysis on a dynamical model of route choice in a connected vehicle environment. *Transportation Research Part C: Emerging Technologies*, Vol. 94, pp. 67-82. DOI: 10.1016/j.trc.2017.10.019.

[J.3] **Park, S.**, Kim, J., Lee, S., and Hwang, K. (2017). Experimental Analysis on control constraints for connected vehicles using Vissim. *Transportation Research Procedia*, Vol. 21, pp. 269-280. DOI: 10.1016/j.trpro.2017.03.097.

[J.2] **Park, S.**, Kim, J., Na, S., and Lee, S.. (2016). Empirical analysis on radio communication range and vehicle ratio in V2X environment. *The Journal of the Korea Institute of Intelligent Transport Systems*, Vol. 15, Issue 5, pp. 29-41. DOI: 10.12815/kits.2016.15.5.029.

[J.1] Kim, J., **Park, S.**, Na, S., and Lee, S. (2015). Sustainable Highway Operations: High Occupancy Lane and Movable Lane. *International Journal of Transportation*, Vol. 3, Issue 3, pp. 1-10. DOI: 10.14257/ijt.2015.3.3.01.

[T.2] **Park, S.** (2024). **CRITICAL TRANSITIONS OF POST-DISASTER RECOVERY VIA DATA-DRIVEN MULTI-AGENT SYSTEMS** (Doctoral dissertation, Purdue University Graduate School).

[T.1] **Park, S.** (2017). **Traffic flow analysis under a connected and autonomous environment through market penetration rates** (Master Thesis, University of Seoul, Seoul, Republic of Korea).

PRESENTATIONS AND CONFERENCES   C=CONFERENCE, PR=PRESENTATION

[Pr.12] **Park, S.** (2025). Integrating Data to Map Human Mobility in Disasters. At the 50th Annual Natural Hazards Workshop. Broomfield, CO, to be presented on July 14, 2025.

[C.12] Lee, S., Benedict, B, **Park, S.**. The structure of institutional and emergent social support networks in long-term disaster recovery: A case of Hurricane Harvey. At INSNA Sunbelt 2025, Paris, France, to be presented on 2, June, 2025.

[Pr.11] **Park, S.** (2025). Critical Transitions of Post-Disaster Recovery Via Data-Driven Multi-Agent Systems. At Gyeonggi Research Institute. Ui-wang, South Korea, 15, May 2025.

[Pr.10] **Park, S.** (2025). Identifying transferable county-level regional interdependence of the post-disaster recovery process using causal discovery. At AI and Cities: An International Forum for Innovation and Collaboration. Gainesville, FL, 9-10, May 2025.

[C.11] **Park, S., Sun, Y., Jiang, S., and Zhao, X.** (2025). Developing a Dynamic Social Vulnerability Index for Public Health (DSVI-PH) to Support Emergency Response. At the National Hurricane Conference 2025. New Orleans, US, 16, April 2025.

[C.10] **Park, S., Sun, Y., Jiang, S., and Zhao, X.** (2025). Developing a Dynamic Social Vulnerability Index (DSVI) for Public Health Using Location-based Data In Hurricane Beryl. At South Eastern Regional Conference. Orlnado, US, 15, March 2025.

[Pr.9] **Park, S.** (2025). Developing a Dynamic Social Vulnerability Index (DSVI) for Public Health Using Location-based Data In Hurricane Beryl. At Data for Good at Meta. Online, US, 11, March 2025.

[Pr.8] **Park, S.** (2025). Tips for Academic Writing and Job Applications. At Incheon National University. Incheon, South Korea, 7, January 2025.

[Pr.7] **Park, S.** (2025). Critical Transitions in Modeling Post-disaster Recovery Process. At the University of Seoul. Seoul, South Korea, 6, January 2025.

[Pr.6] **Park, S.** (2025). Critical Transitions in Modeling Post-disaster Recovery Process. At the Seoul Institute. Seoul, South Korea, 6, January 2025.

[Pr.5] **Park, S.** (2024). Post-disaster Recovery Process in the Era of Human-induced Climate Change. At the University of Seoul. Seoul, South Korea, 18, December 2024.

[Pr.4] **Park, S.** (2024). Post-disaster Recovery Process in the Era of Human-induced Climate Change. At Florida State University. Tallahassee, FL, 6, December 2024.

[C.9] **Park, S.**, Xue, J., and Ukkusuri, S. V. (2024). Finding Critical Transitions of the Post-disaster Recovery Using the Sensitivity Analysis of Agent-based Models. In the 103rd Transportation Research Board Annual Meeting, Washington D.C., 8-12, January 2024.

[C.8] **Park, S.** and Kim, J. (2023). Environmental Implications of Autonomous Demand Responsive Bus in Microscopic Traffic Simulation. In International Conference on Low Carbon Asia and Beyond 2023. Online, 20, October 2023.

[Pr.3] Ukkusuri, S. V., **Park, S.,** and Mittal, S. (2023). Accelerating AI Based Data Analytics for the Recovery of Cities after Disasters (and Pandemics). In One Concern Disaster Resilience Seminar Series, Online, 20, March 2023.

[Pr.2] **Park, S.** and Ukkusuri, S. V. (2023). Recovery of Human Mobility Patterns and Economic Impacts Due to Climate Change Events. In Purdue Road School Poster Session, West Lafayette, 14, March 2023.

[C.7] Xue, J., **Park, S.** (Presenter), Mondal, W. U., Reia, S. M., and Ukkusuri, S. V. (2023). Supporting Post-disaster Recovery with Agent-based Modeling on Multilayer Socio-physical Networks. In the 102nd Transportation Research Board Annual Meeting, Washington D.C., 8-12, January 2023.

[C.6] **Park, S.**, Kim, J., Kim, K., and Lee, S. (2018). Environmental Analysis on Energy and Emissions in a Connected and Autonomous Vehicles Environment. In 4th International Conference on Low Carbon Asia and Beyond (ICLCA'18), Malaysia, 24-26, October 2018.

[C.5] **Park, S.**, Lee, S., and Kim, J. (2018). Avoidable Collision Controls under A Connected and Autonomous Vehicles Environment. In 18th International Conference Road Safety on Five Continents (RS5C 2018), Jeju Island, Republic of Korea, 16-18, May 2018.

[C.4] Lee, S., Heydecker, B. G., Kim, J., and **Park, S.** (2017). Stability Analysis on A Dynamical Model of Route Choice in A Connected Vehicle Environment. In ***Proceedings of the 22nd International Symposium on Transportation and Traffic Theory (ISTTT)***, Chicago, Illinois, USA, 24-26, July 2017, pp. 720-737.

[C.3] **Park, S.**, Kim, J., Lee, S., and Hwang, K. (2016). Experimental Analysis on Control Constraints for Connected Vehicles Using Vissim. In *Proceedings of the International Symposia of Transport Simulation (ISTS) and the International Workshop on Traffic Data Collection and Its Standardisation (IWTDCS)*, Seoul, Republic of Korea, 6-8, July 2016.

[C.2] Lee, S., Kim, J., Na, S., and **Park, S**. (2016). Analysis of Speed Limit Control in V2X Environment. In *Proceedings of ITS World Congress 2016*, Australia, 11-14, October 2016.

[C.1] **Park, S.**, Lee, S., and Kim, J. (2015). Traffic Simulation in V2X Environments with Vissim. In *8th PTV Asia-Pacific User Group Meeting (UGM) 2015*, Bangkok, Thailand.

[Pr.1] **Park, S.** and Lee, J. (2015). Transit Scheduling of Subway No. 9 to Reduce Congestion. Senior Project in Department of Transportation Engineering, Seoul, Republic of Korea.

RESEARCH SKILLS

- **Programming Languages:** Python, Java, and MATLAB
- **Statistical Programs:** R, NLOGIT, Pylogit, and SAS
- **Database Systems:** SQL, NoSQL (Studio3T), and PySpark
- **Data Science & Machine Learning:** Pytorch, Gym, PyMC, Pandas, Scikit-learn, Seaborn, Causal-discovery Toolbox, DoWhy, econml, H2O, and Auto-sklearn
- **GIS tool:** QGIS, PostgreSQL, and Geopandas (Python)
- **Agent-based simulation:** Mesa (Python), MATSim (Java), Netlogo (Java), and Repast Symphony (Python, Java)
- **Transportation Simulation:** EMME/4, TransCAD, VISSIM7+, TSIS-CORSIM (T7F), HCS, HSS, and SUMO

- **Optimization:** GAMS, CPLEX, TOMLAB, and Pyomo
- **Writing:** Word and Latex
- **OS:** Windows and Ubuntu

HONORS AND AWARDS

- **Honorable Mention - Postdoctoral Award** *May 2025*
AI and Cities: An International Forum for Innovation and Collaboration
- **The Best Volunteer Award** *April 2025*
Korean-American Scientists and Engineers Association - Gainesville Chapter
- **Winter 2025 News Letter Spotlight** *February 2025*
Public Health Extreme Events Research (PHEER)
- **Post Doctoral Spotlight** *August 2024*
University of Florida Transportation Institute (UFTI)
- **Erin Flanigan Award ($385)** *2023*
Purdue University
- **Grand prize for Improving contribution of municipal government** *2017*
Seoul Institute
- **Fellowships for accelerated bachelor and master's program ($ 5,600)** *2016, 2017*
University of Seoul
- **The Certificate Awarded by Minister of Land and Infrastructure** *2015*
University of Seoul
- **Scholarship for Excellent Natural Sciences and Engineering ($ 5,600)** *2014, 2015*
University of Seoul
- **Scholarship for Excellent Achievement ($ 1,400)** *2013*
University of Seoul
- **Scholarship for Excellent Achievement ($ 2,800)** *2010*
University of Seoul

LEADERSHIP EXPERIENCE

- **Chapter President** *July 2025 - Present*
Korean-American Scientists and Engineers Association (KSEA) - Gainesville Chapter [🌐]
- **Membership Director (MD)** *Oct 2024 - Aug 2025*
Korean-American Scientists and Engineers Association (KSEA) - Gainesville Chapter [🌐]
- **YG Advisor** *Oct 2024 - May 2025*
University of Florida Korean-American Scientists and Engineers Association - Young Generation (UFKSEA-YG) [🌐]
- **Vice President** *Aug 2022 - Aug 2023*
Institute of Transportation Engineers - Student Chapter at Purdue [🌐]
- **Vice President** *Aug 2022 - Aug 2023*
Purdue Korean Association - Civil Engineers
- **President** *Aug 2021 - Aug 2022*
Purdue Korean Association - Civil Engineers

SERVICES

- **Local Chair in the 2025 National Math and Science Competition** *Apr. 5 2025*
Korean-American Scientists and Engineers Association - Gainesville Chapter
- **Local Organizing Committee in the 2025 South East Regional Conference** *Mar. 15 2025*
Korean-American Scientists and Engineers Association
- **Moderator and Volunteer in Korea-Florida High Technology Forum** *Jan. 13 2025 - Jan. 14 2025*
Neo City, FL.
- **Volunteer in Location-Based Data Operations Group** *Oct. 2024 - Apr. 2025*
Public Health Extreme Events Research (PHEER) network.
  - Working with Public Health Professor Prof. David Eisenman (UCLA, U.S.) and Mónica Rodrigues (University of Coimbra, Portugal).

- **Reviewer**
Journals and Conferences
  - AMR20 and AMR50 in Transportation Research Board Annual Meeting (Jan. 2023 - Jun. 2025)
  - Scientific Reports (Jun. 2025 - Current)
  - Humanities and Social Sciences Communications (SSCI) (Apr. 2025 - Current)
  - International Journal of Urban Science (SSCI) (Feb. 2025 - Current)
  - Natural Hazards Review (SSCI) (Feb. 2025 - Current)
  - Sustainable Communities (Dec. 2024 - Current)

- **Research Team Volunteer** *Jan. 2023 - Jun. 2025*
AMR20 - Disaster Response, Emergency Evacuations, and Business Continuity in Transportation Research Board Annual Meeting

Additional Information

Language: Korean (Fluent) and English (Fluent)

References

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Relationship: Supervisor

3. **Dr. Seungyoon Lee**
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Relationship: Thesis Committee Member

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Relationship: Thesis Committee Member

5. **Dr. Laura Siebeneck**
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Relationship: Co-PI

6. **Dr. Seungjae Lee**
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Relationship: Master's Degree Advisor