

GYUGEUN YOON

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RESEARCH INTEREST

Public Transportation, Transit route planning, Urban mobility, Mobility-as-a-Service, Simulation, Reinforcement learning, Sequential decision process

EDUCATION

- New York University (NYU)**, New York, NY Sept 2017 – Sept 2022
- Ph.D. in Transportation Planning and Engineering, Cumulative GPA: 4.0/4.0
 - Dissertation: Route Design with Optimal Learning
(<https://www.proquest.com/openview/590764f73566013674085c077b0b0325/1?pq-origsite=gscholar&cbl=18750&diss=y>)
 - Academic Advisor: Prof. Joseph Y. J. Chow
- Seoul National University**, Seoul, South Korea Mar 2011 – Feb 2013
- Master of Science in Civil and Environmental Engineering, GPA: 3.94/4.3
 - Thesis: An Analysis of Influencing Section of Speed Humps Using Vehicle Speed Profile Data
(<http://www.riss.kr/link?id=T13744516>)
 - Academic Advisor: Prof. Seung-Young Kho
- Seoul National University**, Seoul, South Korea Mar 2007 – Feb 2011
- Bachelor of Science in Civil and Environmental Engineering, GPA: 3.72/4.3

ACADEMIC EXPERIENCE

- Postdoctoral Research Associate, North Carolina Agricultural and Technical State University** Oct 2022 – Present
(PI: Dr. John Hyoshin Park)
- Graduate Research Assistant, New York University Tandon School of Engineering** Sept 2017 – Sept 2022
- Spectrum of Public Transit Operations: From Fixed Route to Microtransit (FTA Award No. NY-2019-069-01-00)
 - Urban Microtransit Cross-sectional Study for Service Portfolio Design (USDOT Award No. 69A3551747124)
 - CAREER: Urban Transport Network Design with Privacy-Aware Agent Learning (NSF CMMI-1652735)
- Researcher, The Seoul Institute** Jan 2015 – Jun 2017
- Application of Big Data to Establishing Transportation Policy
 - Behavioral Change of Passenger Car Users According to Road Space Reallocation
 - Establishing Action Plan for Pedestrian-Friendly City in Seoul
 - Research for Line Sharing Operation between GTX and Shinbundang Northwestern Extension
 - A Strategy for Designating Special Traffic Management Zones or Facilities
- Research Assistant, Transportation Laboratory, Seoul National University** Mar 2013 – Feb 2015
- General Planning of Pedestrian Environment Improvement in Hongseong County
 - Developing Application Technologies and Installation Techniques for Pedestrian Safety
 - Fare Structure of Public-Private Partnership Projects (Shinbundang Southern Extension)
 - Green Campus Project in Seoul National University Associated with Sillim Light Rail Extension
 - Preliminary Feasibility Studies for New Road Construction plans in Busan Region (Eulsukdo – Janglim Hill)
 - Preliminary Feasibility Studies for New Road Construction plans in Gwangju Region (Sangmu District – Cheomdan Industrial Complex)
 - Development of Technology for Correcting High Risk Drivers' Behavior and Controlling Regulation Violation

Part-time Examiner, Geographic Information Systems (GIS) and Location Based Service (LBS) Laboratory, Seoul National University

Aug 2012 – Mar 2013

- Core System Development for High-Precision Pedestrian Navigation Service

HONORS AND AWARDS

Travel Grant Award at KOTAA Annual Meeting (2020, 2023)

- Awarded by Korean Transportation Association in America (KOTAA)

Micro-transit Hack-a-thon 1st place award (2019)

- Held by International Association of Transportation Regulator and The Transportation Alliance
- Designed a benchmark door-to-door service to compare with the proposed on-demand rideshare service

School of Engineering (SoE) Fellowship (2017 – 2019)

- Conferred to Ph.D. students at NYU Tandon School of Engineering

Researcher of the Year (2016)

- Awarded by The Seoul Institute to the researcher with the best performance annually

Cum Laude (2017 – 2011)

- GPA 3.72/4.3 (93.2/100)

The Presidential Prize of Korean Society of Transportation (2013)

- Honored Prize Conferred to Prospective Students by the President of Korean Society of Transportation

Seoul National University Cooperative Scholarship (2011 – 2012, 4 semesters)

- Granted by The Board of Directors of Seoul National University Cooperative
- Purpose of Supporting Living Expenses

The Presidential Science Scholarship (2007 – 2012, 8 semesters)

- Granted by Roh, Moo-hyun, The 16th President of Republic of Korea
- In Recognition of Korea Student Aid Foundation (KOSAF)

PEER REVIEWED PAPERS

1. Rath, S., Liu, B., **Yoon, G.**, Chow, J.Y.J., 2023. Microtransit deployment portfolio management using simulation-based scenario data upscaling. *Transportation Research Part A*, 169, 103584. doi: [10.1016/j.tra.2023.103584](https://doi.org/10.1016/j.tra.2023.103584).
2. **Yoon, G.**, Chow, J.Y., Dmitriyeva, A., and Fay, D., 2022. Effect of Routing Constraints on Learning Efficiency of Destination Recommender Systems in Mobility-on-Demand Services. *IEEE Transactions on Intelligent Transportation Systems*, 23(5), 4021-4036. doi: [10.1109/TITS.2020.3038675](https://doi.org/10.1109/TITS.2020.3038675).
3. **Yoon, G.**, Chow, J.Y., and Rath, S., 2022. A simulation sandbox to compare fixed-route, semi-flexible transit, and on-demand microtransit system designs. *KSCE Journal of Civil Engineering*, 26, 3043-3062. doi: [10.1007/s12205-022-0995-3](https://doi.org/10.1007/s12205-022-0995-3).
4. Lee, M., Chow, J.Y., **Yoon, G.**, and He, B.Y., 2021. Forecasting e-scooter substitution of direct and access trips by mode and distance. *Transportation Research Part D: Transport and Environment*, 96, 102892. doi: [10.1016/j.trd.2021.102892](https://doi.org/10.1016/j.trd.2021.102892).
5. **Yoon, G.** and Chow, J.Y., 2020. Contextual Bandit-Based Sequential Transit Route Design under Demand Uncertainty. *Transportation Research Record*, 2674(5), 613-625. doi: [10.1177/0361198120917388](https://doi.org/10.1177/0361198120917388).
6. **Yoon, G.** and Chow, J.Y., 2020. Unlimited-ride bike-share pass pricing revenue management for casual riders using only public data. *International Journal of Transportation Science and Technology*, 9(2), 159-169. doi: [10.1016/j.ijtst.2020.01.003](https://doi.org/10.1016/j.ijtst.2020.01.003).
7. **Yoon, G.**, Yoo, G., and Park, B., 2017. The Impact of Urban Road Space Reallocation on Behavioral Change of Passenger Car Drivers: Focused on Hanyangdoseong Region. *Seoul City Research*, 18(3), 85-99. (https://www.kci.go.kr/kciportal/landing/article.kci?arti_id=ART002269494, in Korean)
8. **Yoon, G.**, Jang, Y., Lee, C., and Kho, S., 2016. Identifying Roadway Sections Influenced by Speed Humps Using Survival Analysis *Journal of Korean Society of Transportation*, 35(4), 261-277. doi: [10.7470/jkst.2017.35.4.261](https://doi.org/10.7470/jkst.2017.35.4.261) (in Korean)

WORKING PAPERS/TECHNICAL REPORTS

9. **Yoon, G.** and Chow, J.Y.J., Sequential transit route design by link expansion using knowledge gradient with correlated beliefs, in preparation.
10. Chow, J.Y., Zimmerman, R., Rath, S., Liu, B. and **Yoon, G.**, 2021. *Urban Microtransit Cross-Sectional Study for Service Portfolio Design*. (<https://c2smart.engineering.nyu.edu/wp-content/uploads/2021/12/69A3551747124-Urb-an-Micro-transit-Cross-sectional-Study-for-Service-Portfolio-Design.pdf>)
11. Chow, J.Y., Rath, S., **Yoon, G.**, Scalise, P. and Saenz, S.A., 2020. *Spectrum of Public Transit Operations: From Fixed Route to Microtransit*. (<http://c2smart.engineering.nyu.edu/wp-content/uploads/2020/04/Chow-FTA-Report-NY-2019-069-01-00.pdf>)
12. Yoo, G., Yi, C., and **Yoon, G.**, 2017. *A Study on Application of Big Data for Transportation Policy Development and Improvement*. The Seoul Institute: Seoul. (<http://www.si.re.kr/node/57839>, in Korean)
13. Yoo, G., Kim, S., and **Yoon, G.**, 2016. *Analysis of behavior change in passenger car users due to road space reorganization in the CBD of Seoul*. The Seoul Institute: Seoul. (<http://www.si.re.kr/node/57420>, in Korean)
14. Ha, D., Chang, I., Huh, E., Kim, H., Jang, Y., Chang, K., Kim, M., Yoon, S., **Yoon, G.**, Park, S., Park, S., and Ahn, H., 2014. *Developing Application Technologies and Installation Techniques for Pedestrian Safety*. National Disaster Management Institute, Seoul, 2014. (in Korean)

CONFERENCE PROCEEDINGS

15. **Yoon, G.** and Chow, J.Y.J., 2023. An optimal learning system with correlated beliefs for sequential transit network design. Proc. 102nd Annual Meeting of the Transportation Research Board, Washington DC.
16. **Yoon, G.** and Chow, J.Y.J., 2022. Sequential transit route design by link expansion using knowledge gradient with correlated beliefs. Proc. 11th Triennial Symposium on Transportation Analysis (TRISTAN), Mauritius.
17. Rath, S., **Yoon, G.**, Liu, B., and Chow, J.Y., 2022. Microtransit deployment portfolio management using simulation based data upscaling. Proc. 101st Annual Meeting of the Transportation Research Board, Washington DC.
18. **Yoon, G.**, Rath, S., Chow, J.Y., and Scalise, P., 2021. Advances in fixed route transit, semi-flexible transit, and microtransit toward Mobility-as-a-Service. Proc. 100th Annual Meeting of the Transportation Research Board, Virtual.
19. Lee, M., Chow, J.Y., **Yoon, G.**, and He, B.Y., 2020. Forecasting e-scooter competition with direct and access trips by mode and distance in New York City. Proc. 99th Annual Meeting of the Transportation Research Board, Washington DC.
20. **Yoon, G.** and Chow, J.Y., 2020. Reinforcement learning-based sequential transit route design under demand uncertainty. Proc. 99th Annual Meeting of the Transportation Research Board, Washington DC.
21. **Yoon, G.** and Yoo, G., 2017. An Analysis of Factors Influencing the Behavioral Change of Passenger Car Drivers in CBD Using Tobit Model. Proc. 76th Conference of Korean Society of Transportation, Seongnam, South Korea. (<https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE07627372>, in Korean)
22. Kim, M., **Yoon, G.**, Ha, D., and Kho, S., 2015. Pedestrian environment assessment of rural district: Korean experience. Proc. 11th Eastern Asia Society for Transportation Studies Conference in Cebu, Philippines (Non-reviewed). (https://www.researchgate.net/publication/336881253_Pedestrian_environment_assessment_of_rural_district_Korean_experience)
23. **Yoon, G.**, Hwang, J., Kim, H., and Lee, C., 2013. Analyzing Relationship between Weather and Variability of Travel Time of Bus. Proc. 10th Eastern Asia Society for Transportation Studies Conference in Taipei, Taiwan. (<http://east.info/on-line/proceedings/vol9/PDF/P259.pdf>)

POSTER/PRESENTATION

24. "A simulation sandbox to compare fixed-route, semi-flexible transit, and on-demand microtransit system designs," Bridging Transportation Researchers Conference #4, Virtual, Aug 4-5, 2022.
25. "Knowledge gradient-based sequential transit route design," Google Urban Mobility Simulation and Optimization Workshop, Virtual, Nov 16-17, 2021.
26. "Sequential line planning with learning through knowledge gradient and covariance sampling for emerging mobility networks," 24th IEEE International Conference on Intelligent Transportation Systems - ITSC2021, Indianapolis, IN & Virtual, Sept 19-22, 2021.
27. "Reinforcement Learning-based Transit Operation Design: From Line Planning To Operation Policy," INFORMS Annual Meeting, Virtual, Nov 7-13, 2020.

28. “Simulation Approach to Plan Demand Responsive Transport (DRT) - Relevant study: FTA Project,” 2020 IATR Virtual Conference, Oct 26-29, 2020.
29. “Sequential Line Planning Problem with Integrated Learning for Emerging Mobility Routes,” INFORMS Annual Meeting, Seattle, WA, Oct 20-23, 2019.
30. “Forecasting e-scooter competition with direct and access trips by mode and distance in New York City,” 2019 Transport-Tech Summit, Manhattan, NY, Nov 1, 2019.
31. “Integration of Recommender System in Mobility Services to Improve Seniors’ Accessibility,” 6th Annual Summer Conference on Livable Communities, Kalamazoo, MI, Jun 6-7, 2019.

TEACHING EXPERIENCES

Guest Lecturer Dec 2021

- TR-GY 7133 Urban Public Transportation Systems, NYU Tandon School of Engineering (Fall 2021)

Student Instructor, C2SMART University Transportation Center Apr 2021

- Offered students hands-on experience to learn the tools and skills
- Open-source simulation of transit operation systems in MATLAB (2 sessions)

Teaching Assistant, NYU Tandon School of Engineering Jan – Dec 2020

- TR-GY 7133 Public Transport (grad) (Spring 2020)
- TR-GY 7073 Travel Behavioral Informatics (grad) (Fall 2020)

Mentor of Undergraduate Summer Research Program at NYU Tandon (2019-2021)

- Mentored undergraduates who participated in summer research program
- 1 student per year

SERVICE AND AFFILIATIONS

- Peer reviewer
 - *Transportation Research Record*
 - *Transportation Research Board Annual Meeting*
 - *International Journal of Transportation Science and Technology*
 - *Journal of Transportation Engineering, Part A: Systems*
 - *Bridging Transport Researchers Conference*
- INFORMS, Student member (2019 – Present)
- ITE, Student member (2019 – Present)
- Korean Society of Transportation, Life member (2013 – Present)
- Eastern Asia Society for Transportation Studies (EASTS), Regular member (2013 – Present)
- Republic of Korea Army, Assistant Instructor at Korea Army Training Center (Mar 2009 – Jan 2011)
- Seoul National University Cooperative, Student Committee member (2008, 2011)
- Seoul National University Cooperative, Student Committee Chair, (2012)

SKILLS AND COMPETENCIES

- Ability to use ArcGIS, QGIS, MATLAB, VISSIM, AimSun, NLOGIT, R, SPSS, MS Office
- Korean (Native), English (High proficiency)
- Work and Research Experiences on Various Areas of Transportation Engineering (Urban mobility, Reinforcement learning, Shared mobility, Traveler behavior, Traffic demand, Public transportation, Pedestrian, and Safety)