Jung-Hoon Cho

Ph.D. Candidate

Department of Civil and Environmental Engineering, Massachusetts Institute of Technology (MIT)

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Education

Massachusetts Institute of Technology — Cambridge, MA

◇ Ph.D. in Civil and Environmental Engineering — Sep 2022 – present

Topic: *Deep reinforcement learning, Contextual Reinforcement Learning, Generalization, Multi-objective optimization, Agentic modeling, Large Language Models, Incentive design, Mixed-autonomy traffic, Advisory autonomy, Eco-driving, Sustainable Transportation, Automatic Train Control.*

Advisor: Prof. Cathy Wu

Seoul National University — Seoul, Korea

◇ M.S. in Civil and Environmental Engineering — Mar 2020 – Feb 2022

Thesis: *"Developing Variable Speed Limit Control and Ramp Metering Strategy for Freeways Using Deep Reinforcement Learning"*

Advisor: Prof. Dong-Kyu Kim and Prof. Seung-Young Kho

Seoul National University — Seoul, Korea

◇ B.S. in Civil and Environmental Engineering — Mar 2014 – Feb 2020

Thesis: *"Comparison of Efficiency of Public Bike Repositioning Strategies based on the Temporal and Spatial Predicted Demand Pattern"*

Advisor: Prof. Dong-Kyu Kim

Honors: *Cum laude, Best Thesis Award (2nd place)*

Note: Leave of Absence for Mandatory Military Service in the Republic of Korea Army (2016 – 2018)

Experience

Massachusetts Institute of Technology — MA, USA

Graduate Research Assistant (Laboratory for Information & Decision Systems (LIDS)) — Aug 2022 – present

- ▷ *Auditable Engagement Design for Participation Bias in Transportation Planning*
- ▷ *Leveraging Machine Learning for Energy-Efficient Train Operations*
- ▷ *Estimating Task-space Complexity in Contextual Reinforcement Learning*
- ▷ *Model-Based Transfer Learning/Structure Detection for Contextual Reinforcement Learning*
- ▷ *Learning-based Incentive Design for Eco-Driving Guidance*
- ▷ *Temporal Transfer Learning for Traffic Optimization with Coarse-grained Advisory Autonomy*

PI: Prof. Cathy Wu

Seoul National University — Seoul, Korea

Researcher (Institute of Engineering Research) — Apr 2022 – Jul 2022

- ▷ *Assessment of traffic impact by the construction of parking lot using microsimulation (Samsung C&T)*

PI: Prof. Dong-Kyu Kim

Seoul National University — Seoul, Korea

Graduate Researcher (Transportation Research Laboratory) — Feb 2020 – Feb 2022

▷ *Development of infrastructure information integration and management technologies for real-time traffic safety facility operation (Korean National Police Agency)*
▷ *A Basic Plan for Strategic Project to Build Urban Railway Network in Gyeongsangnam-do Province*
▷ *Analysis of the Effect of Bus Route Adjustment for Daejeon LRT Operation (Korea Railroad Research Institute)*
▷ *Research Project on the Prediction of the Optimal Density of Shared E-scooter System (Deer Corporation)*
PI: Prof. Dong-Kyu Kim and Prof. Seung-Young Kho

VCNC Inc. Seoul, Korea
Value Innovator (Intern) (TADA Business Development Team) Jun 2019 – Aug 2019
▷ *Spatiotemporal big data analysis for vehicle supply and ride assignment system for TADA*
▷ *Designed, operated, and optimized reservation-based ride-hailing services*

Publications[1]

Articles Under Review

[R4] **Cho, J.-H.**, & Wu, C. (2026). AGORA: Can Deliberation and Governance Gates Absorb Participation Bias in Transit Planning?. *Under review.*

[R3] **Cho, J.-H.**, Zhang, H., Du, S., Dong, R., & Wu, C. (2026). Formalizing and Estimating Task-Space Complexity for Zero-shot Generalization. *Under review.*

[R2] Mo, B., Xu, H.*, Ma, R., **Cho, J.-H.**, Zhuang, D., Guo, X., & Zhao, J. (2026). Large Language Models for Travel Behavior Prediction. *Under review.*

[R1] Papalia, A.†, Dawson, C.†, Anton, L. L., Bayomi, N. M., Champenois, B., **Cho, J.-H.**, Cai, L., DelPreto, J., Edwards, K., Githinji, B.-C., Hickert, C., Jayawardana, V., Kramer, M., Raghavan, S., Russell, D., Salimi, S., Shi, J., Sudhakar, S., Wang, Y., Wang, S., Carlone, L., Kumar, V., Rus, D., Fernandez, J. E., Wu, C., Kantor, G., Young, D., & Singh, H. (2025). A Roadmap for Climate-Relevant Robotics Research. *Under review.*

Journal Articles

[J9] **Cho, J.-H.**, Li, S., Kim, J., & Wu, C. (2026). "Temporal Transfer Learning for Traffic Optimization with Coarse-grained Advisory Autonomy," *IEEE Transactions on Robotics* (IEEE T-RO). https://ieeexplore.ieee.org/document/11267090.

[J8] Niazi, M. U. B., **Cho, J.-H.**, Dahleh, M. A., Dong, R., & Wu, C. (2026). "Eco-driving Incentive Mechanisms for Mitigating Emissions in Urban Transportation," *IEEE Transactions on Control of Network Systems* (IEEE TCNS). https://arxiv.org/abs/2410.07952.

[J7] Zhou, T., **Cho, J.-H.**, & Wu, C. (2025). "Nah Bandit for Modeling User Non-compliance in Recommendation Systems," *IEEE Transactions on Control of Network Systems* (IEEE TCNS). https://ieeexplore.ieee.org/document/11130914.

[J6] Kim, J., **Cho, J.-H.**, & Wu, C. (2025). "Reinforcement Learning for Robust Advisories under Driving Compliance Errors," *IEEE Transactions on Intelligent Transportation Systems* (IEEE T-ITS). https://doi.org/10.1109/TITS.2025.3550418.

[J5] Hasan, A., Chakraborty, N., Chen, H., **Cho, J.-H.**, Wu, C., & Driggs-Campbell, K. (2024). "Cooperative Advisory Residual Policies for Congestion Mitigation," *ACM Journal on Autonomous Transportation Systems* (ACM JATS). https://doi.org/10.1145/3699519.

[1] *Papers numbered from earliest and sorted in reverse chronological order.* († for equal contribution, * for correspondence)

[J4] **Cho, J.-H.**, Kim, D.-K., & Kim, E.-J.* (2022). "Multi-scale Causality Analysis between COVID-19 Cases and Mobility Level Using Ensemble Empirical Mode Decomposition and Causal Decomposition," *Physica A: Statistical Mechanics and its Applications* (Physica A). https://doi.org/10.1016/j.physa.2022.127488.

[J3] **Cho, J.-H.**, Seo, Y.-H., & Kim, D.-K.* (2021). "Efficiency Comparison of Public Bike-sharing Repositioning Strategies Based on Predicted Demand Patterns," *Transportation Research Record* (TRR). https://doi.org/10.1177/03611981211016859.

[J2] Ham, S. W., **Cho, J.-H.**, Park, S., & Kim, D.-K.* (2021). "Spatiotemporal Demand Prediction Model for E-scooter Sharing Services with Latent Feature and Deep Learning," *Transportation Research Record* (TRR). https://doi.org/10.1177/03611981211003896.

[J1] **Cho, J.-H.**, Ham, S. W., & Kim, D.-K.* (2021). "Enhancing the Accuracy of Peak Hourly Demand in Bike-Sharing Systems Using a Graph Convolutional Network with Public Transit Usage Data," *Transportation Research Record* (TRR). https://doi.org/10.1177/03611981211012003.

Conference Papers

[C12] **Cho, J.-H.**, Zhang, H., Du, S., Dong, R., & Wu, C. (2026). "Formalizing Task-Space Complexity for Zero-shot Generalization," *Learning for Dynamics and Control Conference* (L4DC), California, United States. [Poster]

[C11] Bang, H.†, **Cho, J.-H.**†, Wu, C., & Malikopoulos, A. A. (2026). "Route Recommendations for Traffic Management Under Learned Partial Driver Compliance," *American Control Conference* (ACC), Louisiana, United States. [Oral] https://arxiv.org/abs/2504.02993.

[C10] Zhou, T.†, **Cho, J.-H.**†, & Wu, C. (2026). "Structure Detection for Contextual Reinforcement Learning," *AAAI Conference on Artificial Intelligence* (AAAI), Singapore. [Poster] (acceptance rate: 17.6%) https://ojs.aaai.org/index.php/AAAI/article/view/40137. https://arxiv.org/abs/2601.08120.

[C9] **Cho, J.-H.**, Jayawardana, V., Li, S., & Wu, C. (2024). "Model-Based Transfer Learning for Contextual Reinforcement Learning," *Conference on Neural Information Processing Systems* (NeurIPS), Vancouver, Canada. [Poster] (acceptance rate: 25.8%) https://arxiv.org/abs/2408.04498.

[C8] Zhou, T., **Cho, J.-H.**, Ardabili, B. R., Tabkhi, H., & Wu, C. (2024). "Expert with Clustering: Hierarchical Online Preference Learning Framework," *Learning for Dynamics and Control Conference* (L4DC), Oxford, United Kingdom. [Poster] https://arxiv.org/abs/2401.15062.

[C7] Niazi, M. U. B., **Cho, J.-H.**, Dahleh, M. A., Dong, R., & Wu, C. (2024). "Incentive Design for Eco-driving in Urban Transportation Networks," *European Control Conference* (ECC), Stockholm, Sweden. [Oral] https://arxiv.org/abs/2311.03682.

[C6] Hasan, A., Chakraborty, N., Chen, H., **Cho, J.-H.**, Wu, C., & Driggs-Campbell, K. (2023). "PeRP: Personalized Residual Policies For Congestion Mitigation Through Co-operative Advisory Systems," *IEEE International Conference on Intelligent Transportation Systems* (IEEE ITSC), Bilbao, Spain. [Oral] https://ieeexplore.ieee.org/abstract/document/10422444/.

[C5] **Cho, J.-H.**, Ham, S. W., Kim, E.-J., & Kim, D.-K.* (2022). "A Comparative Analysis of Usage Patterns of Bike-sharing and E-scooter-sharing in Seoul," *Transportation Research Board 101st Annual Meeting* (TRBAM), Washington DC, United States. [Poster]

[C4] **Cho, J.-H.**, Lee, E. H., Kho, S.-Y., & Kim, D.-K.* (2021). "Developing Variable Speed Limit Control and Ramp Metering Strategy for Freeways Using Deep Reinforcement Learning," *85th Conference on the Korean Society of Transportation*, Jeju, Korea. [Oral]

[C3] **Cho, J.-H.**, & Kim, D.-K.* (2021). "Reinforcement Learning based Variable Speed Limit Control Strategy on Each Lane to Prevent Accident caused by the reduction of highway lanes," *2021 Fall Conference on the Korea Institute of Intelligent Transport Systems*, Jeju, Korea. [Oral]

[C2] **Cho, J.-H.**, Ham, S. W., & Kim, D.-K.* (2021). "Enhancing the Accuracy of Peak Hourly Demand in Bike-Sharing Systems Using a Graph Convolutional Network with Public Transit Usage Data," *Transportation Research Board 100th Annual Meeting* (TRBAM), Washington DC, United States. [Poster]

[C1] **Cho, J.-H.**, Ham, S. W., & Kim, D.-K.* (2020). "A Comparison study on Micro-mobility Usage Pattern: focusing on Bike-sharing service and E-Scooter share service in Seoul, Korea," *Conference on the Korea Institute of Intelligent Transport Systems*, Jeju, Korea. [Oral]

Working Papers

[W1] **Cho, J.-H.**, Niazi, M. U. B., Du, S., Dong, R., & Wu, C. (2025). Learning-Based Incentive Design for Promoting Eco-Driving in Urban Transportation. *In preparation.*

Honors & Awards

Kwanjeong Scholarship, Kwanjeong Educational Foundation 2022 – Present
- *Ph.D. Scholarship*

Fellowship Program for Promoting Diversity and Leadership in ITS, IEEE ITSS 2024
- *Travel Grant*

Speedwell Foundation and the Robert E. Thurber Fellowship, MIT CEE 2022 – 2023
- *Fellowship*

KOTAA TRB Annual Meeting Travel Grant, KOTAA 2022, 2021
- *Travel Grant*

Merit based Scholarship for Graduate Students, Seoul National University 2021
- *M.S. Scholarship (covers tuition)*

Best B.S. Thesis Paper Award, SNU CEE 2019
- *2nd Place*

Best Portfolio Award, SNU CEE 2019
- *1st Place*

Best Undergraduate Paper Award, Korean Institute of Intelligent Transportation Systems 2019
- *Best paper*

Merit based Scholarship, Gwanak Corporation 2019
- *B.S. Scholarship (covers tuition)*

Academic Excellence Award (GPA 4.30/4.30), SNU CEE 2018
- *1st Place*

Merit based Scholarship, Seoul National University 2014 – 2016
- *B.S. Scholarship (covers tuition)*

Civil Structure Contest, Korean Society of Civil Engineers 2016
- *Bronze Medal*

Competition for Creativity, SNU CEE 2014
- *1st Place*

Invited Talks

Cornell Information and Decision Science Laboratory Seminar Remote
Cornell IDS Lab Aug 2025

Presentation: *"Model-Based Transfer Learning for Contextual Dynamical System"*

LIDS Autonomy Tea Talk MA, USA
MIT LIDS Autonomy Tea Talk Nov 2024
Presentation: *"Model-Based Transfer Learning for Contextual Reinforcement Learning"*

Special seminar Seoul, Korea
University of Seoul Jan 2024
Presentation: *"Learning for Traffic Flow Optimization"*

Online seminar Seoul, Korea
KOSEN Jun 2023
Presentation: *"Studying in a U.S. Graduate School: Preparing for a New Start"*

Special lecture at Summer school Seongnam, Korea
Unjung High School Jul 2022, Jul 2021
Presentation: *"Smart Mobility System Using Machine Learning and Data Science"*

Teaching & Tutoring

Department of Civil and Environmental Engineering, Massachusetts Institute of Technology
- 1.041/1.200: Transportation: Foundations and Methods – *Teaching Assistant* Spring 2026

Department of Civil and Environmental Engineering, Seoul National University
- Introduction to Traffic Operation – *Teaching Assistant* Spring 2021, 2020
- Public Transportation Engineering – *Teaching Assistant* Spring 2021
- Integrated Design of Civil Engineering Systems – *Teaching Assistant* Fall 2020
- Traffic Engineering and Laboratory – *Teaching Assistant* Fall 2020

Teach For Korea, Seoul, Korea
- Planning and Operation Manager – *HQ* 2019 – 2020
- Principal Teacher – *Seongbuk School* 2016
- Head of Financial Administration – *HQ* 2015 – 2016
- Led classes in Mathematics, Physics, and Chemistry (13 months, 550+ hours) – *Seongbuk School* 2015 – 2016

Academic Services

Journal Peer-Review

- **Transportation**: Transportation Research Part C: Emerging Technologies (TR-C), Transportation Research Part E: Logistics and Transportation Review (TR-E), IEEE Transactions on Intelligent Transportation Systems (T-ITS), Transportation Research Records (TRR), Transportation, Transport Policy, Data Science for Transportation, Journal of Korean Society of Transportation, Discover Cities
- **Others**: Scientific Report, Journal of Big Data, Physica A, IEEE Transactions on Control Systems Technology (TCST), Knowledge and Information Systems

Conference Peer-Review

- **AI/ML**: AAAI (2026), RLC (2025), ICML (2025), AISTATS (2025), NeurIPS (2025, 2024)
- **Transportation**: TRBAM (2026, 2025), ITS WC (2026, 2025, 2024), IEEE ITSC (2026, 2025, 2024), IEEE IV (2026, 2024)
- **Control/Robotics**: ACC (2026, 2025), ECC (2024), ICRA (2026, 2025)

Workshop Peer-Review

- RSS Workshop AVAS (2024)

Membership

- Graduate Student Member, IEEE (ITSS, RAS, CSS), ASCE, AAAI, INFORMS (TSL), KSEA, KOTAA
- Member, KST, KITS

Mentorship

- George Cao (MIT UROP & 6.7920) 2026 – Present
- Andrew Zheng (MIT 6.7920) 2025 – Present
- Ruth Lu (MIT UROP) 2025 – Present
- Anniston Pierce (MIT Mini UROP) 2026
- Tan Le (MIT Mini UROP) 2026
- Stephen Andrews (MIT UROP) 2025
- Tianyue Zhou (ShanghaiTech, currently MIT PhD student) 2023 – 2025
- Sanjula Jayawardana (ITSS Incubator) 2024
- Rajeev Datta (Caltech, currently Cornell PhD student) 2023

Technical Support

- Bitsensing Inc. – CES 2025 Innovation award 2024
- Seoul Institute 2022

Others

- Mentor for MIT-UF-NEU Joint Summer Research Camp 2026 – Present
- Mentor for MIT CEE Graduate Application Assistance Program (GAAP) 2024 – Present
- Mentor for MIT CEE Peer Mentorship Program 2024 – Present
- Judge for UPenn Ecoventure Challenge 2026
- Mentor for MIT CEE Mini-UROP 2026
- Organizing Committee and Mentor for ITSS Incubator 2024
- Organizing Committee for MIT LIDS & Stats Tea Talks 2023 – 2024

References

Prof. Cathy Wu
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Prof. Eui-Jin Kim
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Ajou University
euijin@ajou.ac.kr