
DONGQIN ZHOU

Postdoctoral Research Fellow ◊ Institute for Experiential AI
d.zhou@northeastern.edu ◊ <https://dongqinzhou.github.io/>

EDUCATION

| | |
|---|----------------------|
| The Pennsylvania State University , University Park, PA, USA Ph.D., Civil Engineering Advisor: Vikash V. Gayah Minor: Operations Research | Aug 2019 - May 2024 |
| Southeast University , Nanjing, Jiangsu, China B.Eng., Traffic Engineering Mao Yisheng Elite Class | Aug 2015 - Jun 2019 |
| University of Waterloo , Waterloo, ON, Canada Exchange student, Civil and Environmental Engineering | Sept 2018 - Dec 2018 |

RESEARCH INTERESTS

Traffic operations and control, Intelligent transportation systems, Infrastructure resilience, Climate-weather extremes modeling and simulation
Deep reinforcement learning, Graph neural networks, Representation learning

RESEARCH & WORK EXPERIENCE

| | |
|---|--|
| Northeastern University <ul style="list-style-type: none">• Postdoctoral Research Fellow, Institute for Experiential AI• Advisor: Auroop R. Ganguly The Pennsylvania State University <ul style="list-style-type: none">• Graduate Research Assistant• University Graduate Fellow | June 2024 - present June 2020 - May 2024 Aug 2019 - May 2020 |
|---|--|

PUBLICATIONS

Journal Publications

1. **Zhou, D.**, & Gayah, V.V. (2024) A Dictionary-Based Bayesian Approach to Optimizing Left-Turn Restriction Locations in Grid Networks. *International Journal of Transportation Science and Technology*, <https://doi.org/10.1016/J.IJTST.2024.10.008>
2. **Zhou, D.**, & Gayah, V.V. (2024) Evaluating the Effectiveness and Transferability of a Data-Driven Two-Region Perimeter Control Method Using Microsimulation. *Transportation Research Record: Journal of the Transportation Research Board*, <https://doi.org/10.1177/03611981241230313>
3. **Zhou, D.**, Gayah, V.V. (2023) Scalable multi-region perimeter metering control for urban networks: A multi-agent deep reinforcement learning approach. *Transportation Research Part C: Emerging Technologies*. 148, 104033. <https://doi.org/10.1016/J.TRC.2023.104033>
4. **Zhou, D.** and Gayah, V.V. (2023) Improving deep reinforcement learning-based perimeter metering control methods with domain control knowledge. *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 2677, No. 7. <https://doi.org/10.1177/03611981231152466>

-
5. **Zhou, D.**, Gayah, V.V. and Wood, J.S. (2022) Integration of machine learning and statistical models for crash frequency modeling. *Transportation Letters*, 1-12.
 6. **Zhou, D.** and Gayah, V. V. (2021) Model-free perimeter metering control for two-region urban networks using deep reinforcement learning. *Transportation Research Part C: Emerging Technologies*, 124, 102949.

Refereed Conference Proceedings

1. **Zhou, D.**, Gayah, V.V. (2025) Multi-Scale Model-Free Perimeter Control and Local Signal Control in Urban Networks. *104th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
2. **Zhou, D.**, Gayah, V.V. (2024) Evaluating the Effectiveness and Transferability of a Data-Driven Two-Region Perimeter Control Method Using Microsimulation. *103rd Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
3. **Zhou, D.**, Gayah, V.V. (2023) A scalable model-free deep reinforcement learning-based perimeter metering control method for multi-region urban networks. *102nd Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
4. Lyu, L., **Zhou, D.**, Liu, H., Gayah, V.V., Guler, S.I. (2023) Adaptive Action Selection Strategy Of Reinforcement Learning Approach For Intelligent Traffic Light Control. *102nd Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
5. **Zhou, D.**, Gayah, V.V. (2022) Integration of human guidance into a reinforcement learning-based perimeter metering control method for urban traffic networks. *101st Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
6. **Zhou, D.**, Gayah, V.V. (2021) Model free perimeter metering control for urban networks using deep reinforcement learning. *100th Annual Meeting of the Transportation Research Board*, January, Washington, D.C. [abstract available in conference proceedings]
7. **Zhou, D.**, Cheng, Q., An, Q., Lu, B. and Liu, Z. (2018) Link criticality analysis based on reliable shortest path in a network with correlated link travel times. *18th COTA International Conference of Transportation Professionals*, 5-8 July, Beijing, China. [abstract available in conference proceedings]
8. Li, Z., Lam, W.H.K., Wepulanon, P. and **Zhou, D.** (2017) Estimating pedestrian walking time on campus based on Wi-Fi detection data. *Transport and Society - Proceeding of the 22nd International Conference of Hong Kong Society for Transportation Studies, HKSTS 2017 (pp. 233-240)*, 9-12 December, Hong Kong, China. [abstract available in conference proceedings]

Journal Paper(s) in Review

1. **Zhou, D.**, Gayah, V.V. (2024) Multi-scale model-free perimeter control and local signal control in urban networks. Submitted for publication in *Transportation Research Part C: Emerging Technologies*, first revision

PROPOSAL DEVELOPMENT & PROJECT ENGAGEMENT

NSF CiviL Infrastructure research for climate change Mitigation and Adaptation

- Role: Technical Project Co-Lead
- Project lead: Ganguly A., Northeastern University

- Project coordination: Sit in discussion meetings, organize meeting minutes, assign writing tasks, integrate and polish individual writeups, ensure proposal cohesion
- Technical contribution: Introduction, research thrust 3
- Other materials: Broader impacts, project management plan, mentoring plan, data management plan, references

DoD Strategic Environmental Research and Development Program (SERDP)

- Sit in monthly research meetings
- Participate in Quarterly Progress Report (QPR) and In-Process Review (IPR)
- Attend annual SERDP symposium

PRESENTATIONS

Research presentations

1. Chatterjee, S., **Zhou, D.**, Dey, S., Mukherjee, O., Watson, J., and Ganguly, A. (2024) A Graph Neural Network Approach for Analyzing Urban Rail Transit System Threat Deterrence. ADSA28: Building Effective Security for Soft Targets. 13-14 November, Boston, MA
2. **Zhou, D.**, (2024) Multi-scale model-free perimeter control and local signal control in urban networks. Conference in Emerging Technologies in Transportation Systems (TRC-30). 2-4 September, Heraklion, Greece
3. **Zhou, D.**, (2024) Evaluating the effectiveness and transferability of a data-driven two-region perimeter control method using microsimulation. *103rd Annual Meeting of the Transportation Research Board*, 10 January, Washington, D.C.
4. **Zhou, D.**, (2023) Multi-region perimeter control with deep reinforcement learning. *Transportation Engineering Seminar at The Pennsylvania State University*, 18 April, University Park, Pennsylvania.
5. **Zhou, D.** and Gayah, V.V. (2022) A scalable model-free deep reinforcement learning-based perimeter metering control method for multi-region urban networks. *2022 Transportation Engineering and Safety Conference*, 7-9 December, University Park, Pennsylvania.
6. **Zhou, D.**, (2022) Macroscopic traffic control with deep reinforcement learning and domain control knowledge. *Transportation Engineering Seminar at The Pennsylvania State University*, 16 Feb, University Park, Pennsylvania.
7. **Zhou, D.** and Gayah, V.V. (2021) Integration of human guidance into a reinforcement learning-based perimeter metering control method for urban traffic networks. *2021 Transportation Engineering and Safety Conference*, 8-10 December, University Park, Pennsylvania.
8. **Zhou, D.**, (2021) Model free perimeter metering control for two-region urban networks using deep reinforcement learning. *Transportation Engineering Seminar at The Pennsylvania State University*, 10 Feb, University Park, Pennsylvania.
9. **Zhou, D.** and Gayah, V.V. (2020) Deep reinforcement learning applied to perimeter metering control: An overview. *2020 Transportation Engineering and Safety Conference*, 9-11 December, University Park, Pennsylvania.
10. **Zhou, D.**, (2020) Model free perimeter control for urban networks using deep reinforcement learning. *College of Engineering Research Symposium*, University Park, Pennsylvania.

11. **Zhou, D.**, Bagherzadehkhorsani, A. and Gayah, V.V. (2019) Travel time prediction using large-scale taxi trip records data. *2019 Transportation Engineering and Safety Conference*, 11-13 December, University Park, Pennsylvania.
12. **Zhou, D.**, (2019) Traffic signal control using reinforcement learning methods. *Research Seminar at The Pennsylvania State University*, 9 Oct, University Park, Pennsylvania.

Invited talks

1. **Zhou, D.**, (2024) Introduction to Reinforcement Learning. *Invited talk at the SDS Lab, Northeastern University*, 14 March, online.

Guest lectures

1. **Zhou, D.**, (2024) Road traffic network simulation and perimeter metering control. *CIVE 7110 – Critical Infrastructure Resilience* (Prof. A. Ganguly, Northeastern University), 26 Nov, Boston, MA
2. **Zhou, D.**, (2022) Macroscopic traffic control with deep reinforcement learning and domain control knowledge. *OR 590 - Operations Research Colloquium* (Prof. J. Ventura, Penn State), 22 Feb, University Park, PA.

AWARDS & HONORS

| | |
|---|-------------|
| • C. Norwood Wherry Memorial Graduate Fellowship , Penn State | 2022 - 2023 |
| • Glenn E. Singley Memorial Graduate Fellowship , Penn State | 2022 |
| • Mark E. and Claire L. Alpert Graduate Fellowship , Penn State | 2021 |
| • Leo P. Russell Graduate Fellowship , Penn State | 2021 |
| • College of Engineering Scholarship , Penn State | 2019 - 2020 |
| • University Graduate Fellowship , Penn State | 2019 - 2020 |
| • Curriculum Scholarships , Southeast University | 2016 - 2019 |
| • Zeng Xianzi Education Foundation Scholarship , Southeast University | 2016 - 2019 |
| • Model Student of Academic Records , Southeast University | 2016 - 2019 |
| • CSC Scholarships, National Prize | 2018 |
| • Jiangsu Provincial Merit Student , Southeast University | 2018 |
| • Third Prize in 14th RoboCup Competition , Southeast University | 2017 |
| • Pacemaker to Merit Student, Highest Honor , Southeast University | 2017 |
| • Mao Yisheng Railway Education Student Scholarship , Southeast University | 2017 |
| • Third Prize in National English Competition for College Students | 2017 |
| • National Encouragement Scholarship, National Prize | 2017 |
| • Third Prize in Advanced Mathematics Competition , Southeast University | 2016 |
| • Third Prize in National English Competition for College Students | 2016 |
| • China National Scholarship, National Prize | 2016 |
| • Merit Student , Southeast University | 2016 |

TEACHING EXPERIENCE

Teaching Assistant, **The Pennsylvania State University**

- Traffic Operations (Prof. V. Gayah) Fall 2022
 - Prepare lab materials (weekly handouts and presentations, and course project)
 - Lead weekly lab sessions (2-hour)
 - Hold regular office hours (2-hour)
 - Grade lab submittals and course project
 - Modify quiz, homework assignments solutions
 - Average student evaluation score: 6.6/7.0
- Transportation Operations (Prof. V. Gayah) Fall 2021
 - Hold office hours (in-person and online)
 - Advise general study plan
 - Help students structure understandings of the course materials

Teaching Assistant, **Southeast University**

- Ethics Cultivation & Basis of Law Fall 2017
 - Lead weekly in-class discussions of student presentations
 - Grade all homework assignments and presentations

REFeree SERVICE

- American Control Conference
- COTA International Conference of Transportation Professionals
- Hong Kong Society for Transportation Studies
- IEEE Intelligent Vehicles Symposium
- IEEE Intelligent Transportation Systems Conference
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Transactions on Mobile Computing
- International Journal of Transportation Science and Technology
- Scientific Reports
- Transportation Research Board
- Transportation Research Part B: Methodological
- Transportation Research Part C: Emerging Technologies
- Transportation Research Record: Journal of the Transportation Research Board
- Transportmetrica B: Traffic Dynamics