DANJUE CHEN

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EDUCATION

Ph.D., Civil & Environmental Engineering, ***Georgia Institute of Technology***, 2012.
B.S., Environmental Science, Applied Mathematics (secondary major), ***Peking University***, China, 2007.

APPOINTMENT

- 2016 –present ***Assistant Professor***, Civil and Environmental Engineering, University of Massachusetts Lowell
- 2015 – 2016 ***Assistant Researcher***, Civil and Environmental Engineering, University of Wisconsin – Madison
- 2013 – 2015 ***Research Associate***, Civil and Environmental Engineering, University of Wisconsin – Madison
- 2012– 2013 ***Postdoc Scholar***, California Partners for Advanced Transportation Technology (PATH), University of California, Berkeley

RESEARCH & TEACHING INTERESTS

- Connected, autonomous vehicles
- Traffic flow modeling & simulation
- Traffic control, ITS
- Smart-Eco truck freight

RESEARCH EXPERIENCE

Modeling & Control of Connected and Automated Vehicles (CAV) 2012-present
(Sponsors: National Science Foundation, USDOT via Transportation Research Center)
Collaborators: Drs. Soyoung Ahn, David Noyce, Steven Shladover

- Modeling traffic operation of mixed traffic (human-driven vehicles and CAV).
- **Developed CAV strategic plans for state DOTs**.
- Developed control for automated truck platooning on terrains to improve traffic efficiency and safety.
- Developed adaptive connected vehicle-enabled Variable Speed Limit (VSL) control system to improve highway operation efficiency and stability.

Traffic Flow Modeling & Control (human-driven traffic) 2007- present
(Sponsor: NSF, Federal Highway Administration, California Department of Transportation)
Collaborators: Drs. Jorge Laval, Soyoung Ahn, Zuduo Zheng, Steven Shladover, Xiao-Yun Lu, Andreas Hegyi

- Developed VSL schemes to improve highway traffic operation and safety in recurrent and/or non-recurrent congestions.
- Studied driver compliance to VSL control and uncovered major control failure mechanisms.
- Modeling driving/platooning behavior that leads to traffic breakdown.
- Modeled mechanisms of and developed control for detrimental traffic flow phenomena, including stop-and-go traffic, traffic breakdown, and capacity-drop.

Truck Freight Modeling & Control 2012-present
(Sponsors: NSF, USDOT via Transportation Research Center)
Collaborators: Drs. Soyoung Ahn, David Noyce

- Developing control for heavy-duty trucks in freight corridors and hubs for efficient and eco operation.
- Modeled longitudinal and lateral behavior of heavy-duty trucks in congested traffic. Quantified impacts of heavy-duty trucks on traffic flow in uphill roadways.

Air Quality Analysis 2005-2007
(Worked in the State Key Joint Laboratory of Environment Simulation and Pollution Control, China)

- Collected sample of air pollutants in southeastern China.
- Identified emission sources of pollutants and established the transmission paths.

PUBLICATIONS

Articles Published in Refereed Archival Journals

(* means corresponding author. Underline indicates students I mentored significantly.)

1. **Chen, D**., Ahn, S., Chitturi, M., Noyce, D., 2017. "Towards vehicle automation: roadway capacity formulation for traffic mixed with regular and automated vehicles". Transportation Research Part B, 100, 196-221.

2. **Chen, D**., Ahn, S., Chitturi, M., Noyce, D.,2017. "Truck platooning on uphill grades under coordinated adaptive cruise control (CACC)". (Proceeding of the 22nd International Symposium on Transportation and Traffic Theory, Chicago, IL. Also forthcoming in Transportation Research Part C.).

3. Han, Y., **Chen, D**., Ahn, S., 2017. "Variable speed limit control at fixed freeway bottlenecks using connected vehicles." Transportation Research Part B, 98, 113-134.

4. **Chen, D**., Ahn, S., Bang, S., Noyce, D., 2016. "Car-following and lane-changing behavior involving heavy vehicles." (2016 Transportation Research Board Cunard Award). Transportation Research Record: Journal of Transportation Research Board, Volume 2561.

5. Han, Y., **Chen, D.**, Ahn, S, 2015. "Analysis of driver response and traffic evolution under variable speed limit control." *Transportation Research Record: Journal of Transportation Research Board*, Volume 2490.

6. **Chen, D.**, Ahn, S., 2015. "Variable speed limit control for non-recurrent severe freeway bottlenecks." *Transportation Research Part C*, 51, 210-230.

7. **Chen, D.**, Ahn, S., Hegyi, A., 2014. "Variable speed limit control for steady and oscillatory queues at fixed freeway bottlenecks." *Transportation Research Part B*, 70(2014), 340-358.

8. **Chen, D.**, Ahn, S., Laval, J. A., Zheng, Z., 2014. "On the periodicity of traffic oscillations and capacity drop: the role of driver characteristics." *Transportation Research Part B*, 59 (1), 117-136.

9. Zheng, Z, Ahn, S., **Chen, D.**, Laval, J. A., 2013. "The effects of lane-changing on the immediate follower: anticipation, relaxation, and change in driver characteristics." *Transportation Research Part C*, 26, 367-379.

10. **Chen, D.**, Laval, J. A., Ahn, S., Zheng, Z., 2012. "Traffic hysteresis: a driver behavioral perspective." *Transportation Research Part B*, 46 (10), 1440-1453.

11. **Chen, D.**, Laval, J. A., Zheng, Z., Ahn, S., 2012. "Traffic oscillations: A behavioral car-following model." *Transportation Research Part B*, 46 (6), 744-761.

12. Zheng, Z., Ahn, S., **Chen, D**., Laval, J. A., 2011. "Freeway traffic oscillations: microscopic analysis of formations and propagations using wavelet transform." *Transportation Research Part B*, 45(9), 1378-1388. (Also in the proceedings of the *19th International Symposium of Transportation and Traffic Theory*, acceptance rate < 15%.)

13. Zheng, Z., Ahn, S., **Chen, D**., Laval, J. A., 2010. "Application of wavelet transform for analysis of freeway traffic: bottlenecks, transient traffic, and traffic oscillations." *Transportation Research Part B*, 45 (2), 372-384.

14. Laval, J. A, **Chen, D**., Guin, A., Benamer, K., Ahn, S., 2009. "Evolution of oscillations in congested traffic: improved estimated method and additional empirical evidence." *Transportation Research Record: Journal of Transportation Research Board*, Volume 2124.

Articles Pending

1. **Chen, D.**, Ahn, S. "Capacity-drop at Extended Bottlenecks: Merge, Diverge, and Weave." (Submitted to *Transportation Research Part B*, under review).

Invited Book chapter:

1. Calvert, S., Mahmassani, H., Meier, J. N., Varaiya, P., Hamdar, S., **Chen, D.**, Li, X., Talebpour, A., Mattingly, S. P., 2018. Chapter "Traffic Flow of Connected and Automated Vehicles: Challenges and Opportunities" in "Road Vehicle Automation 4", Springer.

2. Arem, B., Abbas, M., Li, X., Head, L., Zhou, X., **Chen, D***., Bertini, R., Mattingly, S., Wang, H., Orosz, G., 2016. Chapter "Integrated Traffic Flow Models and Analysis for Automated Vehicles" in "Road Vehicle Automation 3", Springer.

Reports

1. Lu, X., **Chen, D.**, Shladover, S., 2014. "Preparations for Field Testing of Combined Variable Speed Advisory (VSA) and Coordinated Ramp Metering (CRM) for Freeway Traffic Control." Technical Report UCB-ITS-PRR-2014-1, Institute of Transportation Studies, University of California, Berkeley.

2. **Chen, D.**, Ahn, S., Bang, S., Noyce, D., 2016. "Effects of Heavy Vehicles on Dynamic Traffic Features," Project Number 09-08, National Center for Freight & Infrastructure Research & Education.

Conference papers

1. **Chen, D**., Ahn, S., Chitturi, M., Noyce, D. "Modeling of Truck Platooning on Uphill Segments under Coordinated Adaptive Cruise Control (CACC)". The *22nd International Symposium of Transportation and Traffic Theory*, Chicago, 2017 (abstract accepted).

2. Lu, X., Lee, J., **Chen, D.**, Bared, J., Dailey, D., Shladover, S, 2014. "Freeway Micro-simulation calibration: case study using Aimsun and Vissim with detailed field data." The *93rd Annual Meeting of Transportation Research Board*, Washington D.C.

3. Chilukuri, B. R., Laval, J. A., **Chen, D.**, 2013. "Some traffic features during on-ramp queue flush." *The 92nd Annual Meeting of Transportation Research Board*, Washington D.C. (Note: the paper presented in 2013 was significantly revised and enriched after the version presented at the *Innovations in Traffic Flow Theory, and Highway Capacity and Quality of Service Symposium*, Florida, 2012.)

4. **Chen, D.**, Laval, J. A., 2012. "Effects of Queue Spillback in User Optimum Dynamic Traffic Assignment Problem: Analytical and Graphical Solutions on Simple Network." *The 91st Annual Meeting of Transportation Research Board*, Washington D.C.

PROJECTS

1. "Strategic Plan for Connected and Automated Vehicles in Massachusetts", Co-PI, Massachusetts Department of Transportation, Period 5/1/2017-1/31/2018, Project Total Amount $74,982.

2. "Calibration of SPFs for Highway Ramps in Massachusetts", Co-PI, Massachusetts Department of Transportation, Period 6/1/2017-2/28/2018, Project Total Amount $75,000.

PROFESSIONAL SERVICE

Panelist

- *AASHTO - Vehicle to Infrastructure Deployment Coalition (V2I DC)*, TWG 2, 2015-2017
- FHWA/USDOT Work Zone Model Expert Panel, 2016-present

Committee

- Founding Member: Transportation Research Board AHB45 Subcommittee on Traffic Flow Modeling for Connected and Automated Vehicles (AHB 45(3)), 2015-present
- Organizing Committee Member: Breakout Session at Automated Vehicle Symposium, 2015-2016

Conference Activities

Editorial board

- Associate Editor, IEEE-ITSC 2013-present
- Member of International Program Committee, IEEE-ITSC 2014

Journal Referee

- Transportation Research Part A (2014-Present)
- Transportation Research Part B (2015-Present)
- Transportation Research Part C (2010-Present)
- IEEE, Intelligent Transportation System (2010-Present)
- Journal of Advanced Transportation (2013-Present)
- Transportmetrica A: Transport Science (2013-Present)
- Transportmetrica B: Transport Dynamics (2013-Present)
- Transportation Research Record: Journal of Transportation Research Board (2009-Present)
- EURO Journal on Transportation and Logistics (2012-present)

LEADERSHIP/ACTIVITIES

- Co-founder and Manager: *Traffic Flow Webinar,* Georgia Tech, 2010-2012
- Vice President: *Women's Transportation Seminar*, Georgia Tech Chapter, 2010
- Coordinator: *University Transportation Center/Georgia Transportation Institute Luncheon Seminar Series*, Georgia Tech, 2007-2011

AWARDS & HONORS

- *Transportation Research Board Cunard Award*- Best First Young Author Paper in Operations, 2016
- Student Fellowship of the *19th International Symposium on Transportation and Traffic Theory*, 2011
- ITS Georgia *Wayne Shackelford Engineering Scholarship*, 2010