

YING CHEN

Assistant Professor of Instruction, Ph.D.
Northwestern University, CEE & Transportation Center
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EDUCATION

| | | |
|--|-------|------|
| Northwestern University Civil & Environmental Engineering Advisor: Hani S. Mahmassani Thesis Topic: Social Influence and Big Social Media Data Mining: Exploration, Modeling, and Application in Transportation | Ph.D. | 2015 |
| Northwestern University Computer Science Advisor: Michael S. Horn Thesis Topic: When Darwin Met the Multi-Touch Tabletop: Teaching Children the Conceptions of Natural Selection by Tangibles | M.S. | 2011 |
| Harbin Institute of Technology Control Theory and Engineering Advisor: Professor Zexiang Li Thesis Topic: Performance Analysis of Workpiece Localization Algorithm with Computer-Aided-Setup System | M.S. | 2006 |
| Jilin University Computer Science Bachelor of Science in Computer Science | B.S. | 2004 |

RESEARCH INTERESTS

Smart Cities and Data Science
Artificial Intelligence and Machine Learning in Transportation
Connected Vehicles and Autonomous Vehicles
Big Social Media Data Mining for Travelers' Behavior Analysis
Large-scale Transportation Network Modeling and Analysis
Modeling and Solution Approaches for Logistics and Complex Systems
Travel Demand & Behavior Modeling
Agent-based Modeling and Visualization

RESEARCH & PROFESSIONAL EXPERIENCE

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|----------------------------------|---|-------------|
| Northwestern University, | Assistant Professor of Instruction CEE & Transportation Center | 2022 - now |
| Northwestern University, | Adjunct Professor of CEE & Transportation Center | 2019 - 2022 |
| Anthem, Inc., Chicago, IL | Senior Data Scientist | 2019 – 2022 |

- Computational optimization and software development
 - ✓ **NDO** - Provide a standard solution for optimizing the provider network at different geographic level to supply the similar quality and quantity of services for members with the lowest cost
 - Lead the development of critical initiatives to provide critical decision support for customers

- Work with other teams to identify problems and develop NDO tool
- Actuate business values and prioritize business initiatives to ensure delivery of business value
- Machine learning, AI in healthcare
 - ✓ **Program Effectiveness Evaluation** – Developing a framework to evaluate the effectiveness of different intervention programs.
 - ✓ **Medicare Stars** - Building ml-models to predict members' compliance rate, evaluating the efficiency of different member intervention programs and optimizing programs.
 - ✓ **Recommender** - Building a recommendation system based on the similarity of members, recommending a suitable health, dental or vision plan for a new or existing member.
 - ✓ **Next Best Action** – Uplifting modeling for personalizing promotion campaigns to target right members (patients) with the potential to participant.
 - ✓ **Bias Analysis** – Developing a framework to identify and remove the possible bias induced by either cognitive factors or lack of complete data.
 - ✓ **Utilization Analysis** – Developing ml-models to predict the risk of overpayment in utilization management system with claims data, clinical data and sociodemographic data.
 - ✓ **Abnormal Claim Detection** – Building ml-models to identify abnormal overpaid claims by text mining technology, such as Natural Language Processing.

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|---|---|-------------|
| Northwestern University, | Research Assistant Professor of CEE & Transportation Center | 2015 - 2019 |
| Northwestern University | Graduate Research Assistant of Transportation Center | 2012 - 2015 |
| Northwestern University | Graduate Research Assistant of Dep. of Computer Science | 2010 - 2012 |
| Vimicro Corporation | Software Engineer | 2006 –2009 |
| | <ul style="list-style-type: none"> • Developed multimedia embedded processor VC0361 for Microsoft Xbox, VC0342 for HP Elite Book Series, VC0336 for Apple Mac and VC0344 for Microsoft Iceberg project. • Communicating product performance information with customers and a broader cross-functional development team, with responsibility for USB process part and image process part | |
| Harbin Institute of Technology, Shenzhen Graduate School | | |
| | Graduate Research Assistant | 2004 –2006 |

TEACHING EXPERIENCE

Instructor 2015 – now Northwestern University, Evanston, IL.

Data Science for Urban Systems

(2023 Winter)

- Designed and taught this course
- To provide students a solid starting point for using Data Science in their work and research; Students will be able to understand and use standard sequential, conditional, and iterative control structure of automated data analysis through computers; To familiarize students with leading tools used in modern data science practice; To help students understand and use computer programming to collect, analyze and visualize data related to various urban systems challenges.

Data Analytics for Transportation and Urban Infrastructure Applications

(Since 2016 Spring)

- Designed and taught this course

- The ultimate goal of this course is to master the basic data analytical techniques and tools for solving problems through hands-on experiences and projects.
- Covering decision tree, regression, clustering, deep learning, social network analysis, text mining etc.

Uncertainty Analysis in Civil and Environmental Engineering

(Since 2021 Fall)

- Redesigned and taught this course
- The ultimate goal of this course is to master the critical concepts of probability and statistic with an emphasis on solving civil and environmental engineering (and other) questions, and basic data engineering and data science concepts.

RESEARCH GRANTS AND FUNDED RESEARCH SUPPORT

NSF-SBIR Human-Centered, Augmented Intelligence Software for Water and Wastewater, Co-PI (*PI, Throneburg, Mason*), duration 12m, funded by National Science Foundation.

Hub Demand Forecasting (*PI, Mahmassani, H.S.*), Phase I, duration 4m, funded by Hub Group.

DSI Is ours better than mine? Investigating collaborative consumption systems (*PI, Stathopoulos, A.*), Co-PI, duration 6m, funded by the Data Science Initiative at Northwestern University.

Uber Elevate Flight Taxi Project (*PI, Mahmassani, H.S.*), Phase I, duration 3 m, funded by Uber.

Daylight Location Assessment for LTL Terminal Facility (*PI, Mahmassani, H.S.*), duration 3 m, funded by Daylight Transport.

SELECTED PUBLICATIONS

Peer-reviewed Journal

Working on

1. You, J., Liu, Z. and **Chen, Y.***Driving Behavior Classification Model Based on Multivariable Gramian Angular Field Transformation with Unlabeled Data.
2. Biehl, A., **Chen, Y.** and Stathopoulos, A. At the Intersection of Machine and Environmental Learning: What can We Ascertain about Active Mobility via Stage-of-Change Theory?
3. **Chen, Y.**, Gu, Y. and Jin, L. Traveler Activity Analysis through Cell Phone Trajectory Data.
4. **Chen, Y.** Modeling the impact of social networks on drivers' route choice behavior.
5. Zhou, W., Wilbur, M., **Chen, Y.*** and Hyland, M. Assessing the Role of Taxi Services in Urban Mobility: Comparison of Taxi and Transit Travel Times in Chicago.
6. Liang, H., Qian, Y., Zhu, M. and **Chen, Y.***. Modeling the Impact of Social Networks on Drivers' Route Choice Behavior.

Submitted/Under Review

1. Guo, Y., **Chen, Y.**, and Zhang, Y. Forecasting Taxi and TNC Demand using Multi-Task Learning. Transportation Research Part C.

2. Hernandez, A., Raymer, M. and **Chen, Y***. Characterizing the Nature of the COVID-19 Bike Boom. *Transportation Research Interdisciplinary Perspective*.
3. Roger Chen, **Ying Chen** and Guocheng Jiang. Experiments on Reputation Rating Systems for Online Mobility Services. *Travel Behaviour and Society*.
4. Guo, Y., Zhou, Y., Zhang, Y. and **Chen, Y.***. Improving Short-term Demand Forecasting by Feature Embedding. *Computers, Environment and Urban Systems*.
5. Punel, A., Said, M., **Chen, Y.** and Stathopoulos, A. Assessment of Peer-to-peer Shipping System Performance via Communication Analysis. *Journal of Business Logistics*.
6. **Chen, Y.**, Mahmassani, H.S, Yang, H. and Zhao, F. Which Aspect will Matter? Properties of Location-based Social Networks and Travelers' Destination Choice. *Journal of Transport Geography*. (under second review)

Published/In Press

1. Abkarian, H., **Chen, Y.** and Mahmassani, H. (2021). Understanding Ridesplitting Behavior with Interpretable Machine Learning Models using Chicago Transportation Network Company Data. *Transportation Research Record*.
2. Mete, F., Corr, D.J., Wilbur, M.P. and **Chen, Y.*** (2021). Bridge Response and Heavy Truck Classification Framework Based on a Two-step Machine Learning Algorithm. *Transportation Research Record*.
3. Hong, Z., **Chen, Y. *** and Wu, Y. (2020). Following a Safer Driver? A Driver Behavior Scoring System for Connected Vehicles to Keep Safe. *Accident Analysis and Prevention*.
4. Soria, J., **Chen, Y.** and Stathopoulos, A. (2020). Ridesourcing Behavior Profiles: Application of K-Prototype Analysis on Large-scale data from Chicago, Illinois. *Transportation Research Record*.
5. AI Hajj Hassan, L. Mahmassani, H. and Chen, Y. (2020). Reinforcement Learning Framework for Freight Demand Forecasting to Support Operational Planning Decisions. *Transportation Research Part E*.
6. Ale-Ahmad, H., **Chen, Y.** and Mahmassani, H. S. (2020). Travel Time Variability and Congestion Assessment Through the Experience of Mobility Companies: Network Relations and Origin-Destination Clusters. *Transportation Research Record*.
7. Borowski, E., **Chen, Y.***, Mahmassani, H.S. (2020). Social media effects on sustainable mobility opinion diffusion: Model framework and implications for behavior change. *Travel Behaviour and Society*.
8. Zhang, K., **Chen, Y.** and Nie, Y. (2019). Hunting image: Taxi search strategy recognition using Sparse Subspace Clustering. *Transportation Research Part C*.
9. To, D., **Chen, Y.*** and Si, D. (2019). Traveler's Next Activity Predication with Location Social Network Data. *Proceedings of the 3rd ACM SIGSPATIAL International Workshop on Prediction of Human Mobility (PredictGIS 2019)*.
10. **Chen, Y.**, Kim, J. and Mahmassani, H.S. (2018). Operational Scenario Definition in Traffic Simulation-based Decision Support Systems: Pattern Recognition using a Clustering Algorithm. *ASCE's Journal of Transportation Engineering, Part A: Systems*.
11. Xu, X., Mahmassani, H. S. and **Chen, Y.** (2019). Privately Owned Autonomous Vehicle Optimization Model Development and Integration with Activity-Based Modeling and Dynamic Traffic Assignment Framework. *Transportation Research Record: Journal of the Transportation Research Board*, 2673(10), 683–695.

12. Mete, F., **Chen, Y.**, Stathopoulos, A. and Corr, D. (2019). A Comparative Study of Predictive Analysis Methods to Estimate Bridge Response. *Transportation Research Record*, 2673(9), 365–376.
13. Biehl, A., **Chen, Y.**, Sanabria, K., Uttal, D. and Stathopoulos, A. (2018). A Tale of Two Communities: Where does Active Mobility Fit within Narratives Distinguished by Space and Place? *Transportation Research Part A: Policy and Practice*. <https://doi.org/10.1016/j.tra.2018.10.023>
14. **Chen, Y.**, Hyland, M., Wilbur, M., and Mahmassani, H.S. (2018). Characterization of Taxi Fleet Operational Networks and Vehicle Efficiency: Chicago Case Study. *Transportation Research Record: Journal of the Transportation Research Board*. <https://doi.org/10.1177/0361198118799165>
15. Hyland, M., Hong, Z., Pinto, H., and **Chen, Y.*** (2018). Hybrid Cluster-Regression Approach to Model Bikeshare Station Usage. *Transportation Research Part A: Policy and Practice*, 115, 71-89.
16. Hong, Z., **Chen, Y.**, and Mahmassani, H. S. (2018). Recognizing Network Trip Patterns Using a Spatio-Temporal Vehicle Trajectory Clustering Algorithm. *IEEE Transactions on Intelligent Transportation Systems*, 19(8), 2548-2557.
17. **Chen, Y.**, Mahmassani, H.S. and Frei, A. (2018). Incorporating social media in travel and activity choice models: conceptual framework and exploratory analysis. *International Journal of Urban Sciences*, 22(2), 180-200.
18. Hong, Z., **Chen, Y.**, Mahmassani, H.S. and Xu, S. (2017). Commuter Ride-Sharing using Topology-Based Vehicle Trajectory Clustering: Methodology, Application and Impact Evaluation. *Transportation Research Part C: Emerging Technologies*, 85, 573-590.
19. Hong, Z., Mahmassani, H.S., Xu, X., Mittal, A., **Chen, Y.**, Halat, H. and Alfelor Roemer. (2017). Effectiveness of Predictive Weather-Related Active Transportation and Demand Management Strategies for Network Management. *Transportation Research Record: Journal of the Transportation Research Board*, (2667), 71-87.
20. Mjahed, L. B., Mittal, A., Elfar, A., Mahmassani, H.S. and **Chen, Y.** (2017). Exploring the Role of Social Media Platforms in Informing Trip Planning: The Case of Yelp.com. *Transportation Research Record: Journal of the Transportation Research Board*.
21. **Chen, Y.** and Mahmassani, H.S. (2016). Exploring Activity and Destination Choice Behavior in Two Metropolitan Areas Using Social Networking Data. *Transportation Research Record: Journal of the Transportation Research Board*.
22. **Chen, Y.**, Mahmassani, H.S, Hong, Z., Hou, T., Kim, J., Halat, H. and Alfelor, R. (2015). On-line Implementation and Evaluation of Weather Responsive Coordinated Signal Timing Operations. *Transportation Research Record: Journal of the Transportation Research Board*.
23. **Chen, Y.**, Mahmassani, H.S. and Hong, Z. (2015). Improving Online Network Traffic Prediction through Data Mining and Pattern Matching for Dynamic Origin-Destination Demand Estimation. *Transportation Research Record: Journal of the Transportation Research Board*.
24. **Chen, Y.**, Frei, A. and Mahmassani, H.S. (2014). From Personal Attitudes to Public Opinion: Information Diffusion in Social Networks towards Sustainable Transportation. *Transportation Research Record: Journal of the Transportation Research Board*.

25. Kim, J., Mahmassani, H.S., Alfelor, R., **Chen, Y.**, Hou, T., Jiang, L., Saberi, M., Verbas, O. and Zockaie, A. (2013). [Implementation and Evaluation of Weather Responsive Traffic Management Strategies: Insight from Different Networks](#). *Transportation Research Record: Journal of the Transportation Research Board*.
26. **Chen, Y.**, Yan, G., Rawat, D. B., Alnusair, A. and Bista, B. B. (2013). Correcting Image Distortion for Adaptive Cruise Control. *Journal of Electronic Science and Technology*, Vol. 1, No. 1, pp.1-6.

Peer-reviewed Conference Proceeding

Published/In Press

1. Liang, H., Qian, Y. and **Chen, Y***. (2023). Modeling the Impact of Social Networks on Drivers' Route Choice Behavior. Transportation Research Board.
2. Dai, T., Wang, Q., Qiu, Z. and **Chen, Y***. (2023). An Optimization Approach to Design Bike-sharing Station under Uncertainty. Transportation Research Board.
3. Hernandez, A., Raymer, M. and **Chen, Y***. (2022). Characterizing the Nature of the COVID-19 Bike Boom. Transportation Research Board.
4. Abkarian, H., **Chen, Y.** and Mahmassani, H. (2021). Capturing the Effects of Social Networks and Mobility on Viral Spread: Agent-based Model and Scenario Application. Transportation Research Board.
5. Soria, J., **Chen, Y.** and Stathopoulos, A. (2020). Competing on-demand Mobility Services: Spatial and Sociodemographic Investigation of Taxi and Ridesourcing Services in Chicago, Illinois. The 99th Annual Meeting of the Transportation Research Board of the National Academies, 12-16 January, Washington, D.C.
6. Borowski, E., Soria, J., **Chen, Y.**, Schofer, J. and Stathopoulos, A. (2020). Inequities in Utilization of On-Demand Mobility during Rail Transit Disruptions in Chicago. The 99th Annual Meeting of the Transportation Research Board of the National Academies, 12-16 January, Washington, D.C.
7. Borowski, E., **Chen, Y.** and Mahmassani, H. S. (2020). Social Media Effects on Sustainable Mobility Opinion Diffusion: Implications for Behavior Change. The 99th Annual Meeting of the Transportation Research Board of the National Academies, 12-16 January, Washington, D.C.
8. Chen, R., **Chen, Y.** and Jiang, G. (2020). Experiments on Reputation Rating Systems for Online Mobility Services. The 99th Annual Meeting of the Transportation Research Board of the National Academies, 12-16 January, Washington, D.C.
9. Xu, X., Mahmassani, H.S., and **Chen, Y.** (2019). Impact of Autonomous Vehicles on Household Activity and Travel Scheduling: An Integrated Dynamic Network Modeling Approach. The 98th Annual Meeting of the Transportation Research Board of the National Academies, 13-17 January, Washington, D.C.
10. Al Hajj Hassan, L., Mahmassani, H., and **Chen, Y.** (2019). A Reinforcement Learning Framework for Freight Demand Forecasting to Support Operational Planning Decisions. The 98th Annual Meeting of the Transportation Research Board of the National Academies, 13-17 January, Washington, D.C.

11. Al Hajj Hassan, L., **Chen, Y.**, and Mahmassani, H. (2019). Utilization Rate as a Resilience Index for Supply Chain Networks. The 98th Annual Meeting of the Transportation Research Board of the National Academies, 13-17 January, Washington, D.C.
12. Zhang, K., **Chen, Y.**, and Y. Nie. (2019). "Hunting Image": Taxi Search Strategies Recognition Using Sparse Subspace Clustering. The 98th Annual Meeting of the Transportation Research Board of the National Academies, 13-17 January, Washington, D.C.
13. Hong, Z., **Chen, Y.**, and Mahmassani, H.S. (2018). Active Demand Management with Commuter Ride-Sharing Program under Disruptions: A Case Study in Chicago. The 97th Annual Meeting of the Transportation Research Board of the National Academies, 7-11 January, Washington, D.C.
14. Mete, F., **Chen, Y.**, Stathopoulos, A., and Corr, D.J. (2018). Assessment of Bridge Performance through Machine Learning Algorithms: a Comparative Study. The 97th Annual Meeting of the Transportation Research Board of the National Academies, 7-11 January, Washington, D.C.
15. **Chen, Y.**, Hong, Z., Wu, Y., and Mahmassani, H.S. (2018). Keeping Score: Incorporating Driver Behavior Scoring System with Connected Vehicles to Improve Traffic Service Quality. The 97th Annual Meeting of the Transportation Research Board of the National Academies, 07-11 January, Washington, D.C.
16. **Chen, Y.**, Mittal, A and Mahmassani, H.S (2017). Twitter or Chatter? Involving Social Media Data Analysis in Traffic Incident Management. The 96th Annual Meeting of the Transportation Research Board of the National Academies, 08-12 January, Washington, D.C.
17. **Chen, Y.**, Mahmassani, H.S and Zhao, F. (2017). Space, Friendship and Virtual Social Networks: Properties of Location-based Social Networks and Travelers' Destination Choice. The 96th Annual Meeting of the Transportation Research Board of the National Academies, 08-12 January, Washington, D.C.
18. Biehl, A., Sanabria, K., **Chen, Y.**, Uttal D., Stathopoulos, A. (2017). Comparing the (Active) Transport Needs of Neighborhoods using Focus Groups. The 96th Annual Meeting of the Transportation Research Board of the National Academies, 08-12 January, Washington, D.C.
19. **Chen, Y.**, Hong, Z. and Mahmassani, H.S. (2016). Weighted Cluster Analysis for Operational Scenario Definition in Traffic Management Applications. The 95th Annual Meeting of the Transportation Research Board of the National Academies, 10-14 January, Washington, D.C.
20. Hong, Z., **Chen, Y.** and Mahmassani, H.S. (2016). Spatial Trajectory Clustering for Potential Route Identification and Participation Analysis for Carpool Commuters. *The 95th Annual Meeting of the Transportation Research Board of the National Academies*, 10-14 January, Washington, D.C.
21. **Chen, Y.**, Frei, A. and Mahmassani, H.S. (2015). Incorporating Social Media Data in Choice Models: An Exploration. *14th International Conference on Travel Behaviour Research*, 19-23 July, Windsor, U.K.
22. **Chen, Y.**, Frei, A. and Mahmassani, H.S. (2015). Incorporating Social Media Data in Travel Choice Models: Conceptual Framework and Exploratory Analysis. *International Choice Modelling Conference*, 10-13 May, Austin, TX.

23. **Chen, Y.**, Frei, A. and Mahmassani, H.S. (2015). Exploring Activity and Destination Choice Behavior in Social Networking Data. *Proceedings of the 94th Annual Meeting of the Transportation Research Board of the National Academies*, 11-15 January, Washington, D.C.
24. Hong, Z., Mahmassani, H.S. and **Chen, Y.** (2015). Empirical Analysis of Freeway Flow Breakdown and Recovery: The Effect of Snow Weather. . *Proceedings of the 94th Annual Meeting of the Transportation Research Board of the National Academies*, 11-15 January, Washington, D.C.
25. **Chen, Y.**, Talebpour, A. and Mahmassani, H.S. (2015). Friends don't let friends drive on bad routes: modeling the impact of social networks on drivers' route choice behavior. *Proceedings of the 94th Annual Meeting of the Transportation Research Board of the National Academies*, 11-15 January, Washington, D.C.
26. **Chen, Y.**, Kim, J. and Mahmassani, H.S. (2014). Pattern Recognition Using Clustering Algorithm for Scenario Definition in Traffic Simulation-based Decision Support Systems. *17th International IEEE Conference on Intelligent Transportation Systems*.
27. **Chen, Y.**, Frei, A. and Mahmassani, H.S. (2014). An Exploration of Attitude Diffusion Mechanisms in a Social Network. *Proceedings of Computational Approaches to Social Modeling. WebSci 2014*, 24-26 June, Bloomington, IN.
28. **Chen, Y.**, Kim, J. and Mahmassani, H.S. (2014) Pattern Recognition of Weather Scenarios using K-means Clustering Algorithm and Applications in Traffic Simulation-based Decision Support Systems. *Proceedings of the 93rd Annual Meeting of the Transportation Research Board of the National Academies*, 13-17 January, Washington, D.C.
29. Mahmassani, H.S., Kim, J., **Chen, Y.**, Stogios, Y., Brijmohan, A. and Vovsha, P. (2014). Incorporating Reliability Performance Measures into Operations and Planning Modeling Tools. *Proceedings of the 93rd Annual Meeting of the Transportation Research Board of the National Academies*, 13-17 January, Washington, D.C.
30. Zockaie, A., **Chen, Y.** and Mahmassani, H.S. (2014) Time-Dependent Origin-Destination Estimation with En-Route Information Drivers: Methodology and Application to Large-Scale Network. *Proceedings of the 93rd Annual Meeting of Transportation Research Board of the National Academies*, 13-17 January, Washington, D.C.

Other Conference Proceeding

1. Zhou, Y., **Chen, Y.** and Mahmassani, H.S. (2019). Identifying Network Characteristics of Bike-sharing system and Station Usage: Chicago Divvy Bike Case Study. Presented at *INFORMS*, October 20-23, Seattle, Washington.
2. Al Hajj Hassan, L., **Chen, Y.** and Mahmassani, H.S. (2018). Short-term Traffic Flow Forecasting using Approximate Bayesian Computation: Adapting to Perturbations. Will present at the *INFORMS 13th Data Mining and Decision Analytics (DMDA) Workshop*, Phoenix, Arizona.
3. **Chen, Y.**, Mittal, A. and Mahmassani, H.S. (2017). Get Insight into Social Media Analysis and Incident Detection. Presented at *INFORMS*, October 22-25, Houston, Texas.
4. Hyland, M., Hong, Z., Pinto, H., and **Chen, Y.** (2017) A Hybrid Cluster-Regression Approach to Forecast Ridership at Bikeshare Stations: Case Study of Chicago's Divvy System. *The 58th Transportation Research Forum Annual Meeting in Chicago*. ('Best student paper – runner up' award).

5. **Chen, Y.**, Mahmassani, H.S. and F. Zhao. (2016). Properties of Location Based Social Networks and Travelers Destination Choice. Presented at *the Annual Meeting of the Institute for Operations Research and Management Sciences (INFORMS)*, November 13-16, Nashville, Tennessee.
6. Zockaie, A., **Chen, Y.** and Mahmassani, H.S. (2013). Estimating Dynamic Network O-D Patterns with Informed Drivers: Methodology and Large-Scale Network Application. Presented at *the Annual Meeting of the Institute for Operations Research and Management Sciences (INFORMS)*, October 6-9, Minneapolis, Minnesota.

Technical Reports

1. Throneburg, M., **Chen, Y.** and Patel, Sanjay. Human-Centered, Augmented Intelligence Software for Water and Wastewater.

Dr. Chen is a Co-PI for this project. One of main deliverables of this project is to develop machine learning methods for sewer system management and prediction, which focused on two primary needs: 1) predicting overflow volume by augmenting machine learning models with synthetic data to address data coverage limitations and increase accuracy; 2) creating time series forecasts of overflow profile for real-time decision making in hybrid modeling use case. In these cases, the machine learning models are trained to predict the hydrologic system response, numerous models (dozes) may be required to load the hydraulic network.

2. Mahmassani, H.S., **Chen, Y.** and Hassan L. Tools for Tactical Decision-Making/Advancing Methods for Predicting Performance.

Dr. Chen is a core researcher on this project to develop and demonstrate practical techniques that allow short-term forecasts of traffic for the purpose of supporting control actions, and ATDM and DMA interventions.

3. Stathopoulos, A., Horvat, A., **Chen, Y.** and Punel, A. Is Ours Better than Mine? Investigating Collaborative Consumption Systems.

Dr. Chen is a Co-PI for this project. This research will uncover the performance and efficiency of shared systems drawing on extensive crowd-sourced data and innovative data analytics and models. We attempt to solve the problems, such as how do collaborative system promoters (websites, blogs) convey the expected impacts of collaborative consumption to the public? How do consumers make sense of their own use of collaborative consumption? How does the peer-to-peer matching underpinning collaborative consumption systems function?

4. Mahmassani, H.S., Hong, Z., **Chen, Y.**, Xu, X., Frei, A., Talebpour, A. and Halat, H. Analysis, Modeling, and Simulation (AMS) Testbed Development and Evaluation to Support Dynamic Mobility Applications (DMA) and Active Transportation and Demand Management (ATDM) Programs: Chicago Testbed.

Ms. Chen was a core graduate researcher on this study to implement procedures for evaluating weather-responsive traffic management strategies using Weather-Responsive Traffic Estimation and Prediction System (TrEPS) methodologies to support the decision-making process for addressing the disruptive effect of inclement weather on the traffic system. The focus for this project is to determine the value of four strategies (advisory Variable Messaging Systems [VMS], mandatory VMS, speed management and signal control) in response to severe weather conditions, such as blizzards and light to moderate snow events.

5. Mahmassani, H.S. Hou, T., Kim, J., **Chen, Y.**, Halat, H. and Haas, R. (2014). Deployment of Weather-Responsive Traffic Estimation and Prediction System (TrEPS) in Utah. U.S. Department of Transportation, Federal Highway Administration.

Ms. Chen was a core graduate researcher on this study to integrate and operationalize weather-responsive TrEPS models calibrated for the Salt Lake City region to support weather-responsive traffic signal timing implementation and evaluation in the Riverdale corridor in Ogden, UT. Within the project she was contributor to final technical reports and contributed to coding and debugging of on-line estimation and prediction module. For her dissertation work, Ms. Chen is implementing Origin-Destination estimation based on daily link observations according to results of clustering historical traffic flow data in order to improve the accuracy of on-line prediction.

6. Mahmassani, H.S., Frei, C., Frei, A., Story, J., Lem, L., Talebpour, A., **Chen, Y.**, Zockaie, A., Saberi, M., Halat, H., Haas, R. (2013) Analysis of Network and Non-Network Factors on Traveler Choice: Towards Improving Modeling Accuracy for Better Transportation Decision-Making. Contract No: DTFH61-06-D-00005, Task No: T-11-013, U.S. Department of Transportation, Federal Highway Administration.

Ms. Chen was a core graduate researcher on this study to analyze traveler choice behavior changes due to program areas such as Active Transportation and Demand Management (ATDM), Dynamic Mobility Applications (DMA), and Integrated Corridor Management (ICM), with focus on both network (travel time, reliability) and non-network (aesthetics, walk quality, crime) for FHWA. She contributed to present a model of social network based attitude diffusion system in the context of activity and travel choice behavior. For her dissertation work, Ms. Chen is mining data from online location-based social network in order to analyze the influence of social relationship on travelers' destination choice.

7. Mahmassani, H.S., Kim, J. and **Chen, Y.** (2012). SHAR 2 L04 Project Incorporating Reliability Performance Measures in Operations and Planning Modeling Tools. Delcan Corporation.

This study was to develop the capability of producing measures of reliability performance as output in traffic simulation models and planning models. For producing revised estimates of travel patterns, this study examined how travel demand forecasting models can use reliability measures. Ms. Chen is currently working on clustering vehicle trajectories to find travelers' travel patterns for providing potential car-sharing information to travelers, which aims to build an environment-friendly community.

8. Mahmassani, H.S., Kim, J., Hou, T., Zockaie, A., Saberi, M., Jiang, L., Verbas, O, Cheng, S., **Chen, Y.** and Haas, R. (2012) Implementation and Evaluation of Weather Responsive Traffic Estimation and Prediction System. Contract No: DTFH61-06-D-00005, Task No: T-10-005, U.S. Department of Transportation, Federal Highway Administration. (http://ntl.bts.gov/lib/46000/46300/46357/FHWA-JPO-12-055_FINAL_PKG.pdf)

This study was to develop a framework and procedure for implementing and evaluating weather-responsive traffic management (WRTM) strategies using Traffic Estimation and Prediction System (TrEPS) methodologies. Ms. Chen was mainly involved in incident management for Long Island network, specifically developing and expanding the effective incident clearance policies for different weather conditions, which aim at preventing weather-related incidents before occurrence. She was in charge of demand management for Salt Lake City Network. Managing demand is about providing travelers with information, aiming at a "shift" of their departure time or trip cancelation so that the total travel demand during the peak periods can be reduced under different weather conditions in order to maintain a certain level of network performance.

ACADEMIC SERVICE

Dissertation/Thesis Committee

Ph.D. CEE, Northwestern University, Evanston, IL
Moein Hosseini, Hoseb Abkarian, Lama AI Hajj Hassan, Archak Mittal, Xiang (Alex) Xu, Alec Michael Biehl, Zihan Hong, Fiorella Mete

Ph.D. CEE, University of South Florida, Tampa, FL
Yujie Guo

Master CEE, Northwestern University, Evanston, IL
Yuxin Sun, Guanting Li, Hongfeng Liang, Yiheng Qian, Hanjing Li, Zhangchi Liu, Junwei You, Haotian Kang, Fangyue Deng, Zhengqing Gao, Guangyu, Li, Yifei Tang, Jiulin Zhang, Jing Yu, Guocheng Jiang, Anjiang Chen, Jihong Guo, Huaxi Xiang, Yi Huang, Xiazhi Zhang, Hairuilong Zhang, Yuan Chu, Guillaume Etienne Hoareau, Yilun Yang, Yi Gu, Zhening Cui, Shihui He, Yujie Guo

Master CS, Northwestern University, Evanston, IL
Haomin Hu, Fei Zhao

Master MSIT, Northwestern University, Evanston, IL
Kerui Lu, Li-Ya Chiu, Jiayi Wang

Master CSSE, University of Washington, Bothell, WA
Diem To, Craig Rainey

Capstone examiner for Northwestern Master of Project Management Program (MPM)

Cristina Popa, Aaron Demri

PROFESSIONAL SERVICE

Reviewer for Journals:

Transportation Research Part C

Transportation Research Part A

Institute of Electrical and Electronics Engineers (IEEE)

Journal of Modelling in Management

Reviewer for Conferences:

The Transportation Research Board

The International Symposium on Transportation and Traffic Theory (ISTTT)

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