

Haizhong Wang

Curriculum Vitae

October 2013

Title: Assistant Professor, Sept. 2012 - Present
Address: School of Civil & Construction Engineering, Oregon State University, Corvallis, OR, 97331
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Degrees

2010	Ph.D in Civil Engineering	University of Massachusetts, Amherst
2010	M.S. in Applied Mathematics	University of Massachusetts, Amherst
2006	M.S. in Transportation Planning	Beijing University of Technology
2003	B.S. in Civil Engineering	Hebei University of Technology

ACADEMIC POSITIONS

- Assistant Professor with School of Civil & Construction Engineering, Oregon State University, Corvalli, OR July 2012 - Present
- Assistant Professor with Reiners Department of Civil and Environmental Engineering @ Trine University, Angola, IN Jan 2011 - May 2012
- Research Associate with Institute for Multimodal Transportation @ Jackson State University, Jackson, MS June 2010 - Dec. 2010

FIELDS OF SPECIALIZATION

- Traffic Flow Modeling and Simulation
- Traffic System Control and Optimization
- Transportation System Planning and Analysis
- Emergency Management and Disaster Response
- Stochastic Traffic Modeling and Analysis
- Agent-Based Modeling and Simulation

ACTIVE PROJECTS

1. Post-Disaster Transportation Lifeline Network Resilience and Recovery: Resource Location and Allocation Planning. Haizhong Wang and Sal Hernandez. Sponsor: CLiP Program.
2. Preparing a Possible Oregon Road Map for Connected Vehicle/Cooperative Systems Deployment Scenarios. Oregon Department of Transportation. Robert Bertini and Haizhong Wang. Sponsor: Oregon Department of Transportation.
3. Potential Changes to Travel Behavior/Patterns in the Next 20-40 Years: A Fuzzy Cognitive Map Approach. Haizhong Wang. Sponsor: Oregon Department of Transportation.
4. Potential Changes to Travel Behavior/Patterns in the Next 20-40 Years: A Cognitive Map Approach. Haizhong Wang. Sponsor: Oregon Department of Transportation
5. GIS-based Mapping of Bicycle Network "Level of Stress", Bicycle Crashes and the Geo-coded Pavement Conditions for Risk Factor Identification. Haizhong Wang. Sponsor: Pacific Northwest Transportation Center (PacTrans).

PUBLICATIONS (* REPRESENTING OSU STUDENT)

Working Papers

- J20 Yanbing Mao*, Shangjia Dong*, **Haizhong Wang**. Exponential Stability and Asynchronous Stabilization of Discrete-time Switched Linear System. (*In preparation for Journal Submission*).
- J19 **Haizhong Wang**. Multilane Work Zone Traffic Dynamics through Microscopic Intelligent Driver Model (IDM). (*In revisions for Journal Submission*).

- J18 Matthew Palm*, **Haizhong Wang**, John Mueller*. Evaluating Low Bicycle Level of Traffic Stress Accessibility For Predicting Household Demand For Cycling and Walking in Small/Medium-Sized Cities: Does It Matter? (*In revisions for Journal Submission*).
- J17 Shangjia Dong*, **Haizhong Wang**, David Hurwitz. Vehicle-type Specific Headway Distribution in Freeway Work Zones: A Nonparametric Approach. (*In revisions for Journal Submission*).
- J16 Liu Lu*, **Haizhong Wang**, Zhen (Sean) Qian, and Heng Wei. A Hybrid Short-Term Traffic Speed Forecasting Model through Empirical Mode Decomposition and ARIMA (EMD-ARIMA). (*In revisions for Journal Submission*).

Journal Papers Published and Submitted

- J15 Matthew Palm*, Brian Gregor, **Haizhong Wang**, and Starr McMullen. Population Density and Households' Transportation and Housing Cost Trade-Offs. *Under Review with Journal of Transportation Policy*.
- J14 **Haizhong Wang**, Jia Li, and Yang Yu. Modeling and Analysis of Bottleneck Failure Risk Involving Multiple Entrance Ramps: A Copula Approach. *Submitted to Transportmetrica A: Transport Science*.
- J13 **Haizhong Wang**, Zhixia Li, David Hurwitz and Jianjun Shi. Parametric Modeling of the Heteroscedastic Traffic Speed Variance from Virtual Loop Detector Data. *Resubmitted to Journal of Advanced Transportation for Second Round Review on September 05, 2013*.
- J12 Fan Liang, Yang Yu, **Haizhong Wang** and Xiaofeng Meng. Robotic-assisted Motion Prediction: A Nonlinear Fast Adaptive Approach. *International Journal of Advanced Robotic Systems*, Vol. 10, 82:2013.
- J11 Daiheng Ni, and **Haizhong Wang**. A Unified Perspective on Traffic Flow Theory, Part III: Validation and Benchmarking. *Applied Mathematical Sciences*, Vol. 7, No. 40, pp. 1965 - 1982, 2013.
- J10 David S. Hurwitz, **Haizhong Wang**, Michael A. Knodler, Daiheng Ni, Derek Moore. Fuzzy Sets to Describe Driver Behavior in the Dilemma Zone of High-Speed Signalized Intersections. *Transportation Research Part F: Traffic Psychology and Behavior*, Vol. 15, Issue 12, pp. 132-143, March 2012.
- J09 Daiheng Ni, Jia Li, Steven Andrews and **Haizhong Wang**. A Methodology to Estimate Capacity Impact due to Connected Vehicle Technology. *International Journal of Vehicular Technology (IJVT)*, Hindawi Publishing Corporation, Vol. 2012, Article ID 502432, doi:10.1155/2012/502432.
- J08 **Haizhong Wang**, Jia Li, Qian-Yong Chen and Daiheng Ni. Stochastic Modeling of the Equilibrium Speed-Density Relationship. *Journal of Advanced Transportation*, doi: 10.1002/atr.172, 2011.
- J07 **Haizhong Wang**, Jia Li, Qian-Yong Chen, Daiheng Ni. Logistic Modeling of the Equilibrium Speed-Density Relationship. *Transportation Research Part A: Policy and Practice*. Vol. 45, Issue 6, pp. 554 - 566, 2011.
- J06 Jia Li, **Haizhong Wang**, Qian-Yong Chen and Daiheng Ni. A Discussion of Traffic Diffusion and Its Implications. *Mathematical and Computer Modeling*. Vol. 52, No. 9-10, pp. 1626-1633, 2010.
- J05 Jia Li, Qianyong Chen, **Haizhong Wang** and Daiheng Ni. Analysis of LWR model with Fundamental Diagram Subject to Uncertainties. *Transportmetrica*, 1-19, 2011. doi:10.1080/18128602.2010.521532.
- J04 Steven Andrews, **Haizhong Wang**, Daiheng Ni, John Collura and Song Gao. Development and Implementation of an Adapted Planning Methodology in the Event of Two Hurricane Evacuation Scenarios in Western Massachusetts. *Journal of Transportation Safety & Security* 2(4):352-368. doi:10.1080/19439962.2010.517743.

- J03 Zhenbao Wang, Yanyan Chen, **Haizhong Wang**, Yue Yu, Hao Kang. Optimization Methodology of Project Construction Scheduling for Intermodal Terminal Planning Problems. *Journal of Transportation Research Record*. Vol. 2144/2010, pp. 189-196, 2010.
- J02 **Haizhong Wang**, Kimberly Rudy, Jia Li and Daiheng Ni. Calculation of Traffic Flow Breakdown Probability to Optimize Link Throughput. *Applied Mathematical Modeling*. Vol. 34, Issue 11, pp. 3376-3389, 2010.
- J01 Daiheng Ni, **Haizhong Wang**. Trajectory Reconstruction for Travel Time Estimation. *Journal of Intelligent Transportation Systems*. Taylor & Francis. Vol. 12, No. 3, pp. 113-125. 2008.

Conference Papers

- C21 Shangjia Dong*, **Haizhong Wang**, David Hurwitz, and Kevin Heaslip. Vehicle-type Specific Headway Distribution in Freeway Work Zones: A Nonparametric Approach. (*Accepted by the 93rd Transportation Research Board Annual Meeting, Paper # 14-4355* Washington D. C, Jan. 2014).
- C20 Liu Lu*, **Haizhong Wang**, Zhen (Sean) Qian, and Heng Wei. A Hybrid Short-Term Traffic Speed Forecasting Model through Empirical Mode Decomposition and ARIMA (EMD-ARIMA). (*Accepted by the 93rd Transportation Research Board Annual Meeting, Paper # 14-4655* Washington D. C, Jan. 2014).
- C19 Matthew Palm*, Brian Gregor, **Haizhong Wang**, and Starr McMullen. Population Density and Households' Transportation and Housing Cost Trade-Offs. (*Accepted by the 93rd Transportation Research Board Annual Meeting, Paper # 14-1083* Washington D. C, Jan. 2014).
- C18 **Haizhong Wang**, Jia Li, and Yang Yu. Modeling and Analysis of Bottleneck Failure Risk Involving Multiple Entrance Ramps: A Copula Approach. (*Accepted by the 93rd Transportation Research Board Annual Meeting, Paper # 14-0987* Washington D. C, Jan. 2014).
- C17 **Haizhong Wang** and Shangjia Dong. An Agent-based Modeling of the Multimodal Near-field Tsunami Evacuation, *Accepted for Presentation for Conference on Agent-Based Modeling in Transportation Planning and Operations*, Sept. 30 - Oct. 2, 2013, Blacksburg, Virginia.
- C16 Matthew Palm, **Haizhong Wang**, Brian Gregor and Starr B. McMullen, GIS-Based Analysis of Bicycle Network "Level of Stress" and Connectivity: A Household Behavior Perspective. Accepted by the Bicycle Urbanism Symposium: Reimagining Bicycle-Friendly Cities. June 19-22, 2013, Seattle, WA.
- C15 Jiarui Gan, Bo An, **Haizhong Wang**, Xiaoming Sun, and Zhongzhi Shi. Optimal Pricing for Improving Efficiency of Taxi Systems" (Paper # 1332). Proc. of the 23rd International Joint Conference on Artificial Intelligence (IJCAI'13) (Acceptance rate: 28%), August 3-9, 2013, Beijing, China.
- C14 Vukica Jonovanic, **Haizhong Wang**. Mechatronics and Its Applications in Transportation. Submitted to 11th INTERNATIONAL SCIENTIFIC CONFERENCE NOVI SAD, SERBIA, SEPTEMBER 20-21, 2012.
- C13 **Haizhong Wang**, Jia Li, Yang Yu. Modeling and Analysis of Multiple Ramp Flow Interdependency: A Copula Approach. Submitted to TRB 2013 Annual Meeting, Washington D. C.
- C12 **Haizhong Wang**, Christopher Hoogeboom, David Hurwitz. Multilane Traffic Dynamics through Microscopic Intelligent Driver Model. Submitted to TRB 2013 Annual Meeting, Washington D. C.
- C11 Daiheng Ni, Cheng Zhang, and **Haizhong Wang**. A Unified Perspective on Traffic Flow Theory, Part III: Validation and Benchmarking. The proceedings of ASCE-ICCTP 2011 (Paper# 32). August 14-17, 2011. Nanjing, China.
- C10 **Haizhong Wang**, Jia Li, Qian-Yong Chen and Daiheng Ni. Speed-Density Relationship: From Deterministic to Stochastic. Presented at the 88th Transportation Research Board (TRB) Annual Meeting, Washington, D. C. 2009.

- C09 **Haizhong Wang**, Jia Li, Qian-Yong Chen and Daiheng Ni. Representing Fundamental Diagram: the Pursuit of Mathematical Elegance and Empirical Accuracy. Accepted for Presentation at the 89th Transportation Research Board Annual Meeting 2010.
- C08 **Haizhong Wang**, Steven Andrews and John Collura. Scenario-based Analysis of Transportation Impacts in Case of Dam Failure Flood Evacuation in Franklin County, Massachusetts. Accepted for Presentation at the 89th Transportation Research Board Annual Meeting 2010.
- C07 Daiheng Ni, Jia Li, Steven Andrews, and **Haizhong Wang**. Preliminary Estimate of Highway Capacity Benefit Attainable with IntelliDrive Technologies. 13th International IEEE Conference on Intelligent Transportation Systems. Madeira Island, Portugal, September 19-22, 2010.
- C06 Kimberly Rudy, **Haizhong Wang**, and Daiheng Ni. Link Traffic Flow Optimization. Presented at the 87th Transportation Research Board (TRB) Annual Meeting, Washington, D.C. 2008.
- C05 Zhenbao Wang, Yanyan Chen, **Haizhong Wang**, Yue Yu, Hao Kang. Optimization Methodology of Project Construction Scheduling for Intermodal Terminal Planning Problems. Presented at the 89th Transportation Research Board Annual Meeting, Washington D.C. 2010.
- C04 Jia Li, Qianyong Chen, **Haizhong Wang** and Daiheng Ni. Analysis of LWR model with Fundamental Diagram Subject to Uncertainties. Presented at the 88th Transportation Research Board (TRB) Annual Meeting, Washington, D.C. 2009. (09-1189)
- C03 Jia Li, Qian-Yong Chen, **Haizhong Wang** and Daiheng Ni. Investigation of LWR Model with Flux Function Driven by Random Free Flow Speed. Presented at the Symposium on The Fundamental Diagram: 75 Years, July 8-10, 2008 - Woods Hole, MA.
- C02 Reinhard Mahnke, Christof Liebe, Reinhart Kuehne and **Haizhong Wang**. Traffic Flow Prospectives: From Fundamental Diagram to Energy Balance. Presented at the Symposium on The Fundamental Diagram: 75 Years, July 8-10, 2008 - Woods Hole, MA.
- C01 Xiaoming Zhong, **Haizhong Wang**, Jianming Ma, Xiaoduan Sun and Xiaoming Liu. Study on New Concepts of Highway Safety Design-Useful Suggestions for China Highway Development. Presented at the 85th Transportation Research Board Annual Meeting 2006.

INVITED TALKS/PRESENTATIONS

- P12 **Haizhong Wang**, Modeling and Analysis of Bottleneck Failure Risk Involving Multiple Entrance Ramps: A Copula Approach. The 13th COTA International Conference of Transportation Professionals (CICTP 2013), Shenzhen, China, August 13-16, 2013.
- P11 **Haizhong Wang**, Connected Vehicle Technology: A Disruptive Time. IEEE Industrial Applications, Portland, OR, May 15, 2013
- P10 **Haizhong Wang**, Modeling the Heteroscedastic Traffic Speed Variance using Virtual Loop Detector Data, STAR Lab @ University of Washington Seattle, Feb. 15, 2013.
- P09 **Haizhong Wang**, Modeling Dependency with Copula: Implications to Engineers and Planners?, Portland State University, September 28, 2012.
- P08 **Haizhong Wang**, Stochastic Modeling of Equilibrium Speed-Density Relationship: A Behavioral Perspective, Oregon State University, February 22nd, 2012.
- P07 **Haizhong Wang**, Stochastic Modeling of Equilibrium Speed-Density Relationship: A Behavioral Perspective, Michigan Tech University, February 14th, 2012.
- P06 **Haizhong Wang**, Mahesh Nayak, Feng Wang. Emergency Evacuation Study for the Greater Jackson Area - the Gas Spill Scenario. 2nd Annual Technology & Research Summit, November 17, 2010.
- P05 **Haizhong Wang**, Xuesong Zhou, Feng Wang. Spatial Queue-Based Dynamic Flow Simulation & Rapid Response Model for Congestion Mitigation. Informs 2010 Annual Meeting, November 7-10, 2010.

- P04 **Haizhong Wang**. Stochastic Modeling of Fundamental Diagram of Traffic Flow: Theory and Application. Jackson State University, February 10, 2010.
- P03 **Haizhong Wang**. The History of Transportation: Where are we going? The Summer Transportation Institute hosted by IMTrans Jackson State University, June 14, 2010.
- P02 **Haizhong Wang**. Intelligent Transportation System: What is next? College of Engineering Introduction to Engineering Program at Jackson State University. June 21, 2010
- P01 **Haizhong Wang**. Transportation Fundamentals: From Observation to Application. Invited Presentation at Trine University, Nov. 10 2010.

SERVICES

Service to Universities

- Strategic Planning Committee, School of Civil and Construction Engineering, Oregon State University, 2012 - 2013.
- Faculty Search Committee, School of Civil and Construction Engineering, Oregon State University, 2013 - 2014.

Service to Profession

- Editorial Board Member for International Journal of Data Analysis Techniques and Strategies
- Reviewer for the 20th International Symposium on Transportation and Traffic Theory (ISTTT), Netherlands 2013
- Reviewer for Transportation Research Part B: Methodological
- Reviewer for Journal of Transportation Research Record
- Reviewer for Journal of Transportation Safety & Security
- Reviewer IET Intelligent Transport Systems
- Reviewer for Construction & Building Materials
- Reviewer for Safety Science
- Reviewer for ASCE Journal of Computing in Civil Engineering
- Reviewer for Discrete Dynamics in Nature and Society
- Reviewer for Journal of Advanced Transportation

Proposal Review

- Mid-America Transportation Centre (MATC).

PROFESSIONAL MEMBERSHIPS

- Oregon Modelling Steering Committee (OMSC) Oregon State University Representative
- Member of American Society of Civil Engineers (ASCE)
- Member of IEEE Intelligent Transportation Systems Society
- Member of the Transportation Research Board
- Membership of Indiana Institute of Transportation Engineer

AWARDS AND ACTIVITIES

- Technical Session Chair: Transportation Infrastructure Design and Construction. The 13th COTA International Conference of Transportation Professionals (CICTP 2013), Shenzhen, China, August 13-16, 2013.

- 2013 Bicycle & Pedestrian Curriculum Workshop: A Workshop for Transportation Planning & Engineering Faculty Integrating Bicycle & Pedestrian Topics Into University Transportation Curriculum, July 24-26, 2013.
- Attend the NSF Transportation Engineering Curriculum Workshop, Seattle, WA July 30 - August 1 2012.
- Associate Area Editor for the 12th International Conference of Chinese Transportation Professionals 2012, Beijing, P. R. China.
- Associate Area Editor for the 11th International Conference of Chinese Transportation Professionals 2011, Nanjing, P. R. China.
- NSF Travel Scholarship for Engineering and Innovation Conference in Hawaii, Jun. 2009
- Graduate Assistantships from University of Massachusetts Amherst (2006 - 2010)
- Science and Technology Innovation Award, Beijing University of Technology (2005)
- Outstanding Graduate Academic Scholarship in Beijing University of Technology (2003-2005)
- Outstanding Academic Scholarship in Hebei University of Technology (1999-2003)

COMMITTEE AND ADVISING

- Ph.D. Advisor for Shangjia Dong @ Oregon State University
- Master Advisor for Lu Liu @ Oregon State University
- Master thesis committee member for Daniel Holder @ Oregon State University
- Ph.D dissertation committee member for Medha Jannat @ Oregon State University
- Master thesis committee member for Joshua Swake @ Oregon State University
- Master thesis committee member for Patrick Marnell @ Oregon State University
- Master thesis committee member for Ian Roholt @ Oregon State University
- Master thesis committee member for Matthew Palm @ Oregon State University
- Master thesis committee member for Halston Tuss @ Oregon State University
- Master thesis committee member for Derek Moore @ Oregon State University
- Advising undergraduates @ Trine University: 24 students
- Senior design projects @ Trine University: 13 students

TEACHING INTERESTS

- Transportation Engineering
- Transportation System Analysis and Planning
- Traffic Flow Analysis and Control
- Transportation Modeling and Simulation
- Quantitative Methods in Transportation using Python
- Introductory Probability and Statistics for Civil Engineers

COURSE OFFERING

Oregon State University,

Corvallis, OR

School of Civil & Construction Engineering

July 2012 - Present

- CE 491 Transportation Engineering (Fall 2012) (67 students)
- CE 591 Transportation System Analysis, Policy and Planning (Spring 2013)

Trine University,

Angola, IN

Reiners Department of Civil & Environmental Engineering

Jan 2011 - May 2012

- CE3603: Transportation Engineering for 2 repetitions
- CE4603: Highway Geometric Design this fall semester
- CE4903: Computer Tools for Transportation Engineering
- CE4914: Civil Engineering Senior Design I
- CE4914: Civil Engineering Senior Design II
- ES213.02: Engineering Mechanics (Statics) for 3 repetitions

PREVIOUS PROJECTS

- **Emergency Evacuation Study for the Greater Jackson Area: DYNASMART-P Deployment in Mississippi DOT,** Jackson, MS
Test the effectiveness of various ITS-based traffic congestion mitigation strategies such as variable message signs, contraflow lanes, and a combination of both based on a Dynamic Traffic Assignment framework. June 2010 - Present
- **Stochastic Fundamental Diagram for Probabilistic Traffic Flow Modeling. US DOT University Transportation Center (UTC) Region One,** UMass, MA
Development of the stochastic models of the equilibrium speed-density relationship to enable a probabilistic prediction of traffic flow. Nov 2008 - May 2010
- **An Explanatory Approach to Driver Modeling. U.S. DOT University Transportation Center (UTC) Initiative,** UMass, MA
Development of driving behavioral modeling for different traffic conditions. Oct 2009 - May 2010
- **Vehicle Infrastructure Integration (VII): Exploring the Application of Disruptive Technology to Assist Older Drivers. US DOT University Transportation Center (UTC) Region One,** UMass, MA
Field data collection and test the effectiveness of VII instruments. Sep 2009 - May 2010
- **Evacuation Planning Project for Different Scenarios: Hurricane, Dam Flood Failure, and Chemical Spill. Pioneer Valley Planning Commission,** Amherst, MA
Development of an adapted evacuation planning modeling methodology based on the traditional four-step planning process in TransCAD for different case studies such as hurricane, dam flood failure, chemical spill. Sep 2008 - Nov 2009