

Chieh (Ross) Wang

State Materials Office, Florida Dept. of Transportation | 5007 NE 39th Ave, Gainesville, FL 32609, USA
Cell: +1 (404) 457-9967 | E-mail: cw@crosswang.org | Website: <http://crosswang.org>

EDUCATION

Georgia Institute of Technology (Georgia Tech)	
Ph.D. in Civil and Environmental Engineering (GPA 4.0/4.0)	2017
Dissertation: <i>A Spatiotemporal Methodology for Pavement Rut Characterization and Deterioration Analysis Using Long-Term 3D Pavement Data</i>	
National Taiwan University	
M.S. in Civil Engineering (GPA 4.0/4.0)	2007
Thesis: <i>Research on Inattentive Driving Warning and Adaptive Cruise Control Systems</i>	
B.S. in Civil Engineering (GPA 3.6/4.0)	2005

EMPLOYMENT

Staff Civil Engineer, Applied Research Associates, Inc.	2016 – present
Mobile Retroreflectivity Consultant, State Materials Office, Florida Department of Transportation	2016 – present
Graduate Research Assistant, Georgia Tech	2010 – 2016
Full-time Teaching Assistant, National Taiwan University	2008 – 2010
Second Lieutenant, Taiwan Ministry of National Defense	2007 – 2008
Research Assistant, National Taiwan University	2005 – 2007

HONORS AND AWARDS

Transportation Engineering Scholarship, Georgia Institute of Transportation Engineers	2015
Wayne Shackelford Engineering Scholarship, Intelligent Transportation Society of Georgia	2015
CETL Teaching Assistant Fellow, Georgia Tech	2015–2016
CETL/BP Outstanding Teaching Assistant Award Finalist, Georgia Tech	2015
IRF Road Scholar Program Fellow, International Road Federation	2015
Jerry Shea Award, International Road Federation	2015
Bill Schutz Graduate Teaching Assistant Award, School of Civil and Environmental Engineering, Georgia Tech	2014
Babs Abubakari Memorial Scholarship, Georgia American Society of Highway Engineers	2014
Transportation Engineering Scholarship, Georgia Institute of Transportation Engineers	2013
Wayne Shackelford Engineering Scholarship, Intelligent Transportation Society of Georgia	2013
Government Scholarship for Studying Abroad, Taiwan Ministry of Education	2013–2015
Excellent Compulsory Military Service Officer, Taiwan Ministry of National Defense	2008
Rotary Educational Foundation Scholarship, Chung Hua Rotary Educational Foundation	2006
RSEA Engineering Corporation Scholarship, RSEA Engineering Corporation	2006

RESEARCH EXPERIENCE

Georgia Institute of Technology	ATLANTA, GEORGIA, USA
Graduate Research Assistant	2010 – 2016

An Enhanced GDOT Pavement Preservation Guide with Optimal Timing, Georgia Department of Transportation, Project No. #14-06 [2016-2016]

- Coordinated field tests on crack sealing test sites.
- Developed an interactive web-based guide for pavement preservation treatment selection using HTML, CSS, and Javascript (D3.js)

A Remote Sensing and GIS-enabled Asset Management System (RS-GAMS), Georgia Department of Transportation, Project No. #12-10 [2013-2016]

- Collected routine 3D sensing data on interstate highways and selected routes in Georgia
- Processed data in Matlab to enable multi-year spatial and temporal data comparison for monitoring pavement rutting deterioration behaviors
- Analyzed and visualized results using Matlab, R, and D3.js

Developing a GDOT Pavement Marking Handbook Using Field Test Deck Evaluation and Long-term Performance Analysis, Georgia Department of Transportation, Project No. #12-31 [2012-2016]

- Collected/retrieved, processed, and analyzed pavement marking retroreflectivity data on Georgia's test deck and National Transportation Product Evaluation Program (NTPEP) test decks using SQL and R
- Developed statistical models in R to predict pavement marking retroreflectivity for various materials under different traffic and weather conditions
- Conducted life-cycle cost analysis on available pavement marking materials based on test deck data and literature
- Developed a GDOT pavement marking handbook and an interactive web-based tutorial for material selection and training purposes using HTML, CSS, and Javascript

Spatial Traffic Volume Estimation and Projection Methodology for Pavement Resurfacing Prioritization, Georgia Department of Transportation, Project No. #11-03 [2011-2013]

- Analyzed traffic data collected by GDOT's traffic monitoring program
- Developed a spatiotemporal framework that utilizes spatial and temporal information for estimating traffic at unmeasured locations
- Wrote the final report

Georgia Concrete Pavement Performance and Longevity, Georgia Department of Transportation, Project No. #10-10 [2012]

- Organized historical pavement inventory and distress data using SQL, and performed concrete pavement service life analysis
- Assisted in writing the final report

Developing a Sensing Methodology for Intelligent and Reliable Work Zone Hazard Awareness, National Cooperative Highway Research Program - Innovations Deserving Exploratory Analysis (IDEA) Project #139 [2011-2012]

- Led the research team to develop a vision-based highway and work zone vehicle detection and tracking system in Matlab and C++
- Conducted study using the developed vehicle detection and tracking system to analyze the impact of different traffic and roadway characteristics on driving behaviors in work zone
- Wrote the final report

Optimization of Safety on Pavement Preservation Projects, Georgia Department of Transportation, Project No. #09-11 [2011]

- Consolidated data from multiple sources including traffic safety and pavement survey data using SQL
- Proposed a framework for incorporating safety considerations in pavement preservation prioritization
- Assisted in final report writing

A Remote Sensing and GIS-enabled Asset Management System (RS-GAMS), Research and Innovative Technology Administration, U.S. DOT, Contract #DTOS59-10-H-00003 [2010-2011]

- Developed traffic sign inventory graphic user interface in C#, which allowed user to establish ground truth traffic sign information into the database, execute the automated traffic sign detection and recognition systems, and compare the results

National Taiwan University

TAIPEI, TAIWAN

Research Assistant

2005 – 2007

Advanced Safe Smart Vehicle: A Multi-model On-Board Unit and Advanced Driving Assistance System, National Science Council Project #NSC95-2218-E-002-028 [2005-2007]

- Developed a real-time on-board advanced vehicle safety warning system in C++ for inattentive driving behaviors including rear-end collision and lane departure warning
- Installed and connected the developed system with in-vehicle computer so warnings can be issued through the on-board A/V system
- Conducted over 2,000 km real-time road test on the national freeways in Taiwan

PUBLICATIONS

Refereed Journal Publications

1. **C. Wang**, Z. Wang, and Y. J. Tsai (2016) "Piecewise Multiple Linear Models for Pavement Marking Retroreflectivity Prediction under Effect of Winter Weather Events," *Transportation Research Record: Journal of the Transportation Research Board*, no. 2551, pp. 52–61
2. **C. Wang** and Y. J. Tsai (2013) "Use of Reduction-Effectiveness Ratios to Evaluate Reduced Traffic Data Collection Plans," *Transportation Research Record: Journal of the Transportation Research Board*, no. 2339, pp. 13–18
3. T.-H. Chang, C.-S. Hsu, **C. Wang**, and L.-K. Yang (2008) "Onboard Measurement and Warning Module for Irregular Vehicle Behavior," *IEEE Transactions on Intelligent Transportation Systems*, vol. 9, no. 3, pp. 501–513

Manuscripts Submitted

1. G. Wang, **C. Wang**, C. Holzschuher, B. Choubane, and E. Offei (2017) "Effect of Rumble Strip Profiles on OBSI Noise Levels," [submitted for presentation and publication at the 97th TRB Annual Meeting]
2. B. Choubane, J. Sevearance, C. Holzschuher, J. Fletcher, and **C. Wang** (2017) "Development and Implementation of a Pavement Marking Management System in Florida," [submitted for presentation and publication at the 97th TRB Annual Meeting]

Manuscripts in Preparation

1. **C. Wang** and Y. J. Tsai (2017) "Lane Boundary-based Three-Dimensional Pavement Data Registration," *Journal of Infrastructure Systems* [to be submitted in September 2017]
2. **C. Wang** and Y. J. Tsai (2017) "Three-Dimensional Pavement Rutting Characterization and Classification," *Journal of Transportation Engineering* [to be submitted in November 2017]
3. **C. Wang**, B. Choubane, and C. Holzschuher (2017) "A JavaScript Framework for Developing Web-based Video Log Applications," <https://crosswang.org/GSViL/vidlog.html> [manuscript under internal review]
4. A. Misra, A. Greenwood, **C. Wang**, K. Watkins, and H. V. Jagadish (2017) "Snapping Locational Point Data to Large Street Networks: Nearest Neighbor vs. Adjacency Matrix Approach," [manuscript under revision]
5. A. Misra, **C. Wang**, H. V. Jagadish, and K. Watkins (2017) "Choice Set Generation for Bicyclists Using Large Scale GPS Data," [manuscript under revision]

Conference Papers & Presentations

1. **C. Wang** and Y. J. Tsai (2017) "Categorizing Pavement Rutting Using 3D Laser Imaging Technology," in *World Conference on Pavement and Asset Management, WCPAM 2017*, Milan, Italy
2. **C. Wang** and Y. J. Tsai (2017) "Characterizing Rut Deterioration Using 3D Pavement Data: A Pilot Study on Georgia State Route 26," in *Transportation Research Board 96th Annual Meeting*, Washington D. C.
3. **C. Wang** and Y. J. Tsai (2017) "Registration of 3D Pavement Data over Multiple Timestamps for Rut Deterioration Analysis: A Semi-automated Method," in *Transportation Research Board 96th Annual Meeting*, Washington D. C.
4. **C. Wang**, Z. Wang, and Y. J. Tsai (2016) "Piecewise Multiple Linear Models for Pavement Marking Retroreflectivity Prediction under Effect of Winter Weather Events," in *Transportation Research Board 95th Annual Meeting*, Washington D. C.
5. Y. J. Tsai, **C. Wang**, Z. Wang, R. Douds, and B. Bui (2015) "Improving Reliability of Pavement Marking Performance Evaluation by Identifying and Removing Irregular Variability in Field Retroreflectivity Measurements," in *Transportation Research Board 94th Annual Meeting*, Washington D. C.
6. R. Boadi, **C. Wang**, A. Amekudzi-Kennedy, and Y. J. Tsai (2014) "Aligning System Performance with Investment Levels: Applying Response Surface Methodology to Manage Program-Level Vulnerabilities," in *10th National Conference on Transportation Asset Management*, Miami, FL
7. **C. Wang** and Y. J. Tsai (2013) "Evaluation of Reduced Traffic Data Collection Plans Using Reduction-Effectiveness Ratios," in *Transportation Research Board 92nd Annual Meeting*, Washington D. C.
8. **C. Wang** and Y. J. Tsai (2012) "Spatial Traffic Estimation for Pavement Preservation Prioritization," in *8th Annual Inter-university Symposium on Infrastructure Management*, Atlanta, GA
9. Y. J. Tsai, Y. Wu, **C. Wang**, E. Pitts, and N. Cressman (2012) "Integrating Safety into Resurfacing Project Reprioritization for Minimizing Pavement-Deficiency-Induced Safety Risk," in *Transportation Research Board 91st Annual Meeting*, Washington D. C.
10. Y. J. Tsai, **C. Wang**, and Y. Wu (2011) "A Vision-Based Approach to Study Driver Behavior in Work Zone Areas," in *3rd International Conference on Road Safety and Simulation*, Indianapolis, IN
11. T.-H. Chang and **C. Wang** (2010) "Vision-Based Onboard Unit for Inattentive Driving Warning and Car-Following Control," in *2010 IEEE Intelligent Vehicles Symposium*, San Diego, CA, pp. 585-590

Technical Reports (*Primary Author)

1. "A Remote Sensing and GIS-enabled Asset Management System (RS-GAMS) Phase 2," Final Report, Research Project #12-10, Georgia Department of Transportation, 2017 [forthcoming]
2. "Developing a GDOT Pavement Marking Handbook Using Field Test Deck Evaluation and Long-term Performance Analysis," Final Report, Research Project #12-31, Georgia Department of Transportation, December, 2015* [selected as a High-Value Research Project and featured in *Research Impacts: Better-Faster-Cheaper*, an annual publication of AASHTO's Research Advisory Committee (RAC)]
3. "Spatial Traffic Volume Estimation and Projection Methodology for Pavement Resurfacing Project Prioritization," Final Report, Research Project #11-02, Georgia Department of Transportation, February, 2013*
4. "Georgia Concrete Pavement Performance and Longevity," Final Report, Research Project #10-10, Office of Materials and Research, Georgia Department of Transportation, December, 2011
5. "Developing a Sensing Methodology for Intelligent and Reliable Work Zone Hazard Awareness," Project #139, Final Report, NCHRP IDEA Program, October, 2011*

6. "Optimization of Safety on Pavement Preservation Projects," Final Report, Research Project #09-11, Office of Materials and Research, Georgia Department of Transportation, September, 2011

Other Publications

1. D. Pritchard, G. Macfarlane, and C. Wang (2015) "A L^AT_EX Template for Papers Submitted to the Transportation Research Board," https://github.com/chiehrosswang/TRB_LaTeX_tex
2. C. Wang (2016) "A Microsoft Word Template for TRB Peer Review Papers," https://github.com/chiehrosswang/TRB_MSWORD

Other Presentations & Invited Talks

1. "Utilizing Emerging Technologies for Transportation Asset Management," University of Florida Transportation Institute, April, 2017
2. "Registering 3D Pavement Data for Rut Deterioration Analysis," State Materials Office, Florida Department of Transportation, April, 2017
3. "Better Data for Better Roads - The Charm of 3D Sensing Data," Monthly meeting of the Institute of Transportation Engineers Georgia Section (Georgia ITE), April, 2016
4. "New Data Collection and Connectivity Technologies - Benefit and Challenges," Monthly meeting of the Intelligent Transportation Society of Georgia (ITS Georgia), February, 2016
5. "Developing Sensing Methodology for Intelligent and Reliable Work Zone Hazard Awareness, NCHRP IDEA Project 139," Transportation Research Board Annual Meeting, Washington DC, January, 2012 & 2013
6. "Research on Advanced Vehicle Control and Safety System (AVCSS)," Transportation Engineering Seminar, Graduate Institute of Civil Engineering, National Taiwan University, September, 2009

TEACHING EXPERIENCE

Georgia Institute of Technology

Atlanta, Georgia, USA

Graduate Teaching Assistant

CEE 3000 Civil Engineering Systems

Fall 2014, Spring 2016

- Co-instructed lectures in engineering economics, covered topics including cash flows, project evaluation, inflation, and depreciation
- Held office hours and review sessions for homework and exam preparation; led in-class practices; prepared and graded homework assignments; provided solutions for practice exam problems and exams
- Received 4.4 and 4.9/5.0 overall effectiveness rating from the Teaching Assistant Opinion Survey

CEE 6621 GIS in Transportation

Spring 2013, Fall 2013

- Taught introductory and advanced GIS lectures and labs, including projection, ArcGIS Python Add-ins, spatial data analysis, and geostatistics

Teaching Assistant Fellow

2015 – 2016

Center for the Enhancement of Teaching and Learning, Georgia Tech

- Led groups of new TAs through orientation sessions, including a body and voice (communication) workshop, a roles and responsibility session, and a policies and procedures session to help prepare new TAs for the fall 2015 and spring 2016 semesters

Graduate Mentor

Summer 2011

National Science Foundation – Collaborative Research Experiences in Advanced Technology and Engineering (NSF-CREATE) Program, Georgia Tech Savannah

- Advised undergraduate student John Paul Moore on his research that quantifies water holding capacity and hydroplaning hazards of asphalt pavement surfaces using the ridge-to-valley depth characteristics of the surface texture

National Taiwan University

Taipei Taiwan

Full-time Teaching Assistant

2008 – 2010

Department of Civil Engineering

- Assisted in design, instruction, and assessment of civil/transportation engineering courses, including Engineering Mathematics, Environmental Engineering, Applied Mechanics, Transportation Engineering, Transportation Systems, Engineering Statistics, Engineering Economics, Fluid Mechanics Experiments, and Civil Engineering Materials
- Administered the operations of the Transportation Engineering Division and coordinated with the Department and other divisions

Director (2004) and Instructor

2002 – 2005

National Taiwan University Fellowship Lanyu Educational Camp (PreK-12)

- Designed and taught 2-week active learning courses in basic science, math, language, computer science, finance, ethics, and music to children aged from 3 to 18
- Visited families and conducted annual survey to better understand children's background and in-class behavior, and to build long-term relationships with children and their families
- Kept records of each child for better awareness of classroom diversity and student needs

Student Tutor

2002 – 2007

- Tutored high school and middle school students in preparation of the national joint college entrance exam and the national high school entrance exam in the following subjects: Physics, Mathematics, Chemistry, Earth Science, and English
- Tutored college students in Engineering Graphics (AutoCAD)

PROFESSIONAL SERVICE

Committees - Leadership & Membership

Member, TRB Maintenance and Preservation Section (AHD00)	2017 – present
Co-chair, Young Members Subcommittee, TRB Maintenance and Preservation Section (AHD00(1))	2017 – present
Member, TRB Standing Committee on Signing and Marking Materials (AHD55)	2015 – present
Communications Coordinator, TRB Standing Committee on Signing and Marking Materials (AHD55)	2015 – present
Co-chair (2014-present)/Secretary (2013)/Webmaster, Taiwan Transportation Professionals Technical Information Exchange Organizing Committee	2012 – present
Publicity Chair and Webmaster, 8th Annual Inter-university Symposium on Infrastructure Management Planning Committee (AISIM)	2011 – 2012

Reviewer

ASCE Journal of Computing in Civil Engineering	2016 – present
Journal of Modern Transportation	2014 – present
ASCE Journal of Infrastructure Systems	2012 – present
Transportation Research Record & TRB Annual Meeting	2012 – present
IEEE International Conference on Intelligent Transportation Systems (ITSC)	2010 – present
GeoHubei International Conference 2014	2013
IEEE Intelligent Vehicle Symposium (IV)	2010

Student Chapters - Leadership

President, American Society of Highway Engineers at Georgia Tech	2015 – 2016
Treasurer, American Society of Engineering Education at Georgia Tech	2015 – 2016
Technology Chair, American Society of Engineering Education at Georgia Tech	2014 – 2015
Vice President of Finance, Institute of Transportation Engineers at Georgia Tech	2013 – 2014
Treasurer, Women’s Transportation Seminar at Georgia Tech	2013 – 2014

Affiliation

Student Member, American Society of Civil Engineers (ASCE)	2011 – 2016
International Member, Institute of Transportation Engineers (ITE)	2011 – 2016
Student Member, American Society of Highway Engineers (ASHE)	2013 – 2016

CERTIFICATES

Teaching Certificate, Tech to Teaching Program, Georgia Tech	2016
Graduate Communication Certificate, Georgia Tech	2015