

# WATMOVES

UW-ITE STUDENT CHAPTER NEWSLETTER

Issue No. 8 Spring Term 2014



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## Message from the President

Fall is one of my favourite seasons; the air is crisp and it always reminds me of fresh endeavours and new beginnings. In 2008, I walked into my first class here at the University of Waterloo's Civil Engineering undergraduate program with the intent of pursuing a career in transportation. Here I am, six years later, still walking here on campus as I continue my education as a Masters student, now with the opportunity to welcome both returning and incoming students in transportation.

What an exciting time it is to be in this field of study and research! Across this continent, policy makers understand the importance of planning, implementing, and maintaining transportation infrastructure in order to ensure the economic, environmental, and social vitality of cities and regions. Investments are being made in improving our transit systems, cycling networks, and roadways throughout Ontario. Here in Waterloo Region, construction is now underway for a new light rail transit line that will significantly shape the growth of Kitchener and Waterloo. As evident by these investments, now is an excellent time to be learning concepts, researching best practices, and developing innovative solutions in transportation. Our efforts and work will be relevant to solving today's transportation challenges. The students and faculty here at the University of Waterloo are well positioned to tackle the present challenges in transportation. Our strengths include sustainable pavement design, traffic engineering, road safety, and transit planning.



Together with over 50 graduate students, 45 undergraduate traffic engineering students and 5 faculty members that focus in transportation here at Waterloo, you are in good company.

The University of Waterloo Institute of Transportation Engineers (UW-ITE) Student Chapter is an important aspect that facilitates a balanced academic and student life here at Waterloo while building a community among students in our department. UW-ITE strives to provide opportunities for students to socialize with peers and network with experts in the industry. Our recent efforts and events are highlighted in this edition of WatMoves.

Thanks to the UW-ITE Executive who have spent time in the preparation of this newsletter, and thanks to you for taking the time to read this edition! Enjoy this fresh start, and see what you can discover over the next year. See you out there at our next event!

*Kevin Yeung, M.A.Sc. Candidate  
President, UW-ITE*

## Academic Events

Michael Linton



Spring 2014 has proved to be event filled academic season for the UW-ITE Student Chapter. During this term, the student chapter facilitated one technical tour hosted by the Region of Waterloo and hosted three academic seminars.

### Technical Tour

The Region of Waterloo hosted the UW-ITE Student Chapter at their headquarters on May 5<sup>th</sup>, 2014 to give us a glimpse into their operations. Rapid Transit (ION) Group gave a presentation on the proposed LRT line, affording UW-ITE members the opportunity to engage in discussions to address technical concerns. Grand River Transit (GRT) presented on their operations and gave insights into how they used AVL and APC data, as

well as future plans to more effectively supply the public with information to make more informed decisions towards transit usage. The site visit concluded with a presentation by the Region's Signal Operation team and a tour of their Signal Operations Center. The Signal Operation team discussed some of the issues they currently face and plans for improving pedestrian and vehicular movement across the Region while maintaining safety on those modes.

### Academic Seminars

On June 10<sup>th</sup>, 2014 UW-ITE welcomed Mr. Takis Salpeas, Parsons' Global Rail and Transit Director, who shared his experiences working in the transit industry. He discussed his journey from being involved in transit organizations



such as Southeastern Pennsylvania Transportation Authority (SEPTA) and the Washington Metropolitan Transit Authority to his current directorial role at Parsons. He highlighted several complex mega-projects and offered valuable insight into the problems that can be encountered and the unique ways in which challenges can be resolved.



**Mr. Takis Salpeas sharing his experiences in the transit industry**

Dr. Morteza Bagheri presented a seminar entitled “Rail Safety: Challenges and Opportunities” on July 16<sup>th</sup>, 2014. An assistant professor of Iran University of Science and Technology, Dr. Bagheri discussed the risks associated with train derailments and the problem of highway railway grade crossing accidents. A lengthy discussion involving most of the audience followed, which led to a brainstorming session that provided suggestions on further reducing of such risks.

Our final presenter for the term was Mr. Gene Chartier, UW alumnus and Transportation Engineer with Hatch Mott MacDonald on July 24<sup>th</sup>, 2014. Mr. Chartier took attendees through his own journey from a student to his experience working in both the public and private sectors in the transportation engineering world. He went through in great detail one of the projects he was responsible for seeing to completion, the focus of which was road safety. Attendees also received guidance into jumpstarting their own careers as future transportation engineers and the expectations associated with various aspects of the industry.

## Social Events

Janki Bhavsar, Ehsan Bagheri



As part of the 2014 CITE Conference in Waterloo Region, on the evening of June 3rd, 2014, the annual student mixer was held in downtown Kitchener at the pub Bobby O'Brien's. Most UW-ITE executive members together with many UW students attended the mixer to meet with other members and professionals from both public and private sector. It had been a great opportunity for students and potential employers to get to know each other in a casual atmosphere.

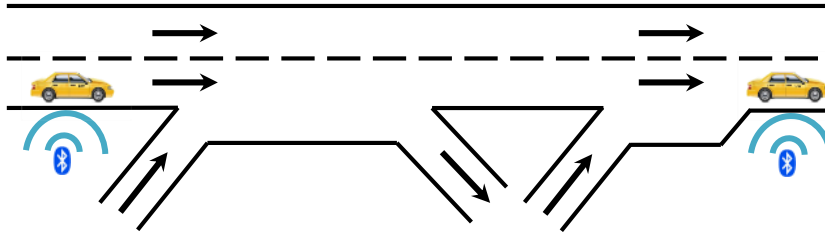
interact with the old students and learn about our transportation program in details.



The welcome luncheon early in September is definitely something to look forward to. At this luncheon the new students will get a chance to

## Project Highlight

Bluetooth based Travel Time Information System  
Dr. Bruce Hellinga, Amir Zarinbal, Wenfu Wang



*"Accurate travel time information help travelers make better route choice decisions and assist transportation agencies for real-time traffic management and control purposes." – Wenfu Wang*

Bluetooth technology is now gaining its popularity in travel time studies due its low installation cost and high mobility: the costs of implementing Bluetooth based travel time detection systems are significantly lower compared to the costs of similar loop detector based systems; Bluetooth detector installations do not block traffic and the detectors can be easily moved between various sites for special purposes (e.g., measure and update Variable Message Signs at temporary construction zones). When vehicles carrying Bluetooth enabled devices pass consecutive Bluetooth detectors, their unique Bluetooth IDs are time stamped and recorded into the database of the system; by pairing the downstream detections with those from upstream detections, the corresponding time each vehicle takes to pass a segment, the average travel time, and space mean speed can be obtained.

With various advantages over traditional detection technologies, researchers and practitioners still face challenges in using Bluetooth based travel time data. One of the biggest challenges lies in the fact that Bluetooth detection technique is essentially an interval detection technology. During congested periods, vehicles detected at upstream detectors will take longer time to reach downstream detectors; before vehicles

are re-identified at downstream detectors, no information is updated in-between. To alleviate the influence of the above mentioned delay in Bluetooth data reporting, we propose to adjust the Bluetooth based travel time data using additional Bluetooth measurements.



The use of additional Bluetooth data requires the understanding of the discovery process for Bluetooth devices. Therefore, we developed our own Bluetooth detection module and conducted field tests to understand the relationships between Bluetooth detections and the prevailing traffic states. Based on the field test results, we then conducted simulation study to analyze the results we obtained. The initial results are promising, and we plan to conduct more field tests to fully understand these relationships and to come up with our own efficient Bluetooth detectors.

## Doctoral Student Highlight

Usama Elrawy Shahdah



Usama Shahdah is a Transportation Engineering Ph.D. candidate within the Department of Civil and Environmental Engineering at the University of Waterloo. He has been working under the supervision of Professors Frank Saccomanno and Bhagwant Persaud. He also obtained his master of applied science degree in 2009 from Waterloo. The focus of his Master's was on quantifying the mobility benefits of winter road maintenance (WRM), in which he used microscopic traffic simulation model (i.e., INTEGRATION) to investigate the benefits of achieving bare road surface conditions

His research is concerned with comparing and integrating observational crash-based and traffic conflict from microscopic traffic simulation models for predicting crashes, prioritising sites for different types of interventions and for obtaining estimates of treatment effect. The approaches used to predict crashes in previous research has been subject to considerable debate especially as it

relates to the use of observational crash-based models based on reported crashes versus traffic simulation models of safety performance.

Mr. Shahdah has received a number of awards and scholarships including "Ontario Graduate Scholarship, "UW President's Graduate Scholarship "UW Special Graduate Scholarship, "Ontario Student Opportunity Grant (OSOG)" and "Canadian Transportation Research Forum (CTRF)", Award for distinguished Transportation Students.

Mr. Shahdah has a strong background in statistical analysis and traffic engineering, with knowledge of a number of specialized software packages. For example, he is a professional user of three microscopic traffic simulation models, namely: INTEGRATION, VISSIM and SIMTRAFFIC. In addition to statistical packages, such as, SAS and R-Language. He is also a professional user of statistical models used with the full Bayes models, namely: WinBUGS, OpenBUGS and JAGS, under both Windows and Linux operating systems.

*"I do believe my current PhD research will help guide how safety analysis should be carried out in the future."* – Usama Elrawy Shahdah

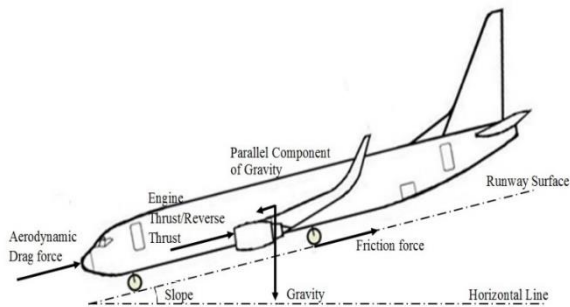


# Master Student Highlight

Cheng Zhang

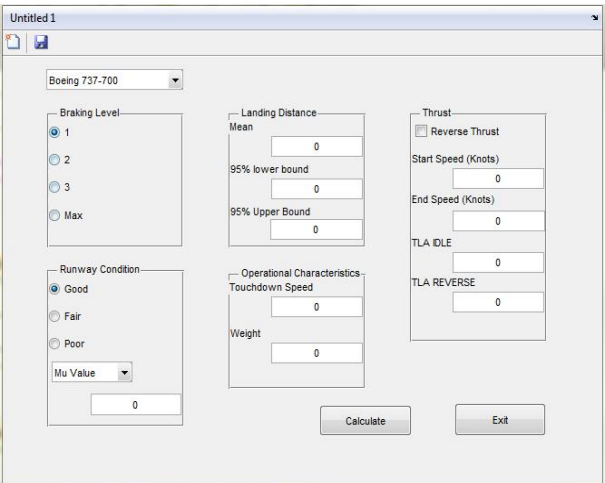


Cheng Zhang completed his Master of Applied Science in the Center for Pavement and Transportation Technology (CPATT) at the University of Waterloo under the supervision of Prof. Susan Tighe. He achieved his Bachelor degree in Civil Aviation University of China. Cheng’s research interest focuses on pavement engineering and airport engineering. His current study is to improve airport runway condition assessment and aircraft braking performance analysis.



In his study, a mechanistic-empirical method was developed to help provide recommendations for airports that are subjected to diverse weather conditions. This method integrates pilot configurations, aircraft

operational characteristics, accurate amounts of reverse thrust, aircraft braking system characteristics, and runway friction conditions. The method is based on the mechanistic analysis and calibrated with digital flight data. It can be applied to calculate required landing distance before aircraft lands to mitigate the risk of runway overrun. It can also be used to optimize quick exit taxiway design and airport operations, as well as to help airlines control and reduce fuel consumption.



In his spare time, Cheng enjoys playing sports and travelling, and is an avid photographer.



# Undergraduate Student Highlight

Jessica Deslippe



*“The community of transportation engineers is a relatively small one; you will be encountering the same people time and again at various events, as well as through work. I was shocked at the number of people I recognized already, just from 3 co-ops. Conferences are worth the money to make connections and become known in the industry, especially in the beginning of your career.” – Jessica Deslippe*

Jessica Deslippe is a civil engineering undergraduate student entering her 4B term at the University of Waterloo in the Winter 2015 term. Most recently, she completed the first half of the 4<sup>th</sup> year design project as part of her 4A term. Her group’s project was to evaluate the feasibility of transforming the intersection of York St – University Ave – Front St, located downtown Toronto, into a roundabout with a pedestrian bridge.

This was a very ambitious project as it touches upon numerous aspects of transportation engineering including A-typical intersection analysis, pedestrian modelling, traffic forecasting, volume balancing, etc. Most of these topics are not covered in details at the undergraduate level. In addition, participants in

this project needed to understand the planning aspects of projects. Since some of these aspects including data acquisition and budgeting have barely been seen at school, she worked her way through everything from scratch.

Outside of school, Jessica has worked to expand the “soft skills” emphasized throughout co-op education. She recently attended the CITE & OTC Joint Conference hosted by the Region of Waterloo and is an executive member of the University of Waterloo Leaders in Infrastructure. Jessica has also been awarded a TAC Foundation scholarship and will attend the TAC Conference & Exhibit at the end of September 2014.

## Recent Awards

Received by UW-ITE Student Chapter Members

Congratulations to the following students on their achievement!

Student	Program	Award
Jessica Deslippe	BASc	TAC Foundation Parsons Scholarship
Adam Felinczak	BASc	TAC Foundation Peto MacCallum Scholarship
Edward Lau	BASc	TAC Foundation MMM Group Scholarship
Stewart Jackson	MASc	Canadian Transportation Research Forum Scholarship on Transportation Safety
Michael A. Linton	MASc	TAC Foundation CIMA+ Scholarship
Ehsan Bagheri	PhD	TAC Foundation ATS Traffic Group Scholarship
Gulfam E Jannat	PhD	Queen Elizabeth II Graduate Scholarship in Science and Technology Canadian Technical Asphalt Association Graduate Scholarship
Shahin Karimidorabati	PhD	University of Waterloo Doctoral Thesis Writing Award
Sina Varamini	PhD	TAC Foundation Waterloo Alumni Centennial Scholarship

## Closing Remarks from the Editor

The release of this WatMoves issue marks its three years anniversary since the delivery of the first issue. WatMoves has now become a regular celebration of our achievements and an encouragement to us when we are facing various challenges.

In the past term, the University of Waterloo ITE Student Chapter has hosted/facilitated various meaningful academic and social events, and one event to highlight is our co-hosting of the Student Mixer for the 2014

Canadian Institute of Transportation Engineers Annual Conference in the Waterloo Region. Thank you and congratulations to everyone who made these events possible!

With efforts and hardworking, we are expecting a more productive and successful 2014 Fall Term. Hope everyone enjoy this WatMoves issue!

*Wenfu Wang,  
WatMoves Issue 8 Editor*

## Sponsors

### UW-ITE Sponsors

We would like to thank our sponsors for supporting and helping us achieve our chapter goals. So we give a big THANK YOU to Hatch Mott MacDonald, CIMA+ and TSRG for their support during this year.

If you would like to get more information on sponsorship opportunities, please contact Kevin Yeung at [uw.ite.sc@gmail.com](mailto:uw.ite.sc@gmail.com). There is

Visit our website for more information on sponsorship opportunities.

also more information about the student chapter and sponsorship levels in our website,

[www.civil.uwaterloo.ca/transportation/ite](http://www.civil.uwaterloo.ca/transportation/ite).

We also welcome companies who are interested in coming to Waterloo to present unique transportation projects that they are undertaking.

### Gold Level:

**Want to be our sponsor?  
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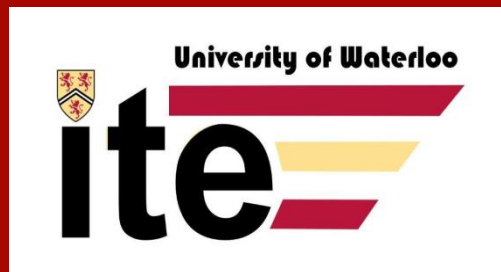


**Hatch Mott  
MacDonald**

### Bronze Level:







**UW-ITE Student Chapter**

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