


# WATMOVES UW-ITE STUDENT CHAPTER NEWSLETTER

Issue No. 2 Spring 2012

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## Message from the UW-ITE SC

The University of Waterloo Institute of Transportation Engineers Student Chapter (UW-ITE SC) is happy to publish its second newsletter. These newsletters are great tools and opportunities for UW-ITE SC to inform individuals and industries outside the school about the activities inside the Transportation Systems Research Group at the University of Waterloo as well as the projects undertaken by professors and students. After the first issue of the WatMoves, positive feedbacks, both from the industry world and academia, encouraged us to continue along this route more seriously and with the experience we obtained from our last issue, the editorial committee tried to improve the current issue.

We hope and will be happy to receive your comments to improve our future works.

The editorial board of this issue of our WatMoves consisted of the following individuals:

**Amir Ghods** – President (PhD Candidate)

**Soroush Salek Moghaddam**  
VP (PhD Candidate)

**David Duong**  
Secretary (PhD Candidate)

**Roshanak Taghipour**  
Academic Events Director (MASC Candidate)

**Deborah Santiago**  
Webmaster (MASC Candidate)

**Mohab El Hakim**  
Social Event Director (PhD Candidate)

**Ehsan Bagheri**  
Volunteer member (PhD Candidate)

**Akram Nour**  
Volunteer member (PhD Candidate)



**York Region ITS  
Presentation - Steve Kemp  
and Rajeev Roy**

## Academic Events

The UW-ITE Student Chapter has passed another successful academic season. During the winter term, the student chapter hosted CITE student presentation competition and job fair as well as four academic seminars.

### CITE Student Presentation Competition

On March 26<sup>th</sup>, UW-ITE Student Chapter hosted the 2012 Joint CITE Hamilton, Southwestern Ontario, and Toronto Section Student Competition and Job Fair. The competition took place on two levels of graduate and under-graduate students. The following students won the three awards of each competition level:

Graduate Level	Undergraduate Level
1. Ehsan Bagheri	1. Matthew Sweet
2. Roshanak Taghipour	2. Aneta Zaskowska
3. Mario Reyes Galfan	3. Mohammad Bari

Congratulations to all the winners!



CITE Presentation Competition - Winners

Four companies including CIMA+, Paradigm Transportation Solutions, Dillon Consulting, and MMM participated in the job fair at the University of Waterloo. Students took this opportunity to explore their potential future careers in these companies.



CITE Job Fair

### Periodic Seminars

On April 3<sup>rd</sup>, 2012 the UW-ITE SC hosted two presenters from the transportation industry. Mr. Steve Kemp, director of Traffic Management and ITS at Regional Municipality of York talked about ITS technologies used in the York Region. Mr. Rajeev Roy, manger of York Region Transit, also presented a seminar entitled "Transit Technology". The seminars were well received by the students and professors.

On February 29<sup>th</sup>, 2012 the UW-ITE SC hosted Shahin Karimi Dorabati, PhD student. He presented his research entitled "Automated Process for Change Management in Construction Industry". Although the electricity cut off during his presentation, he continued and delivered the required concepts of his research topic to the audiences.

Amir Ghods, PhD Candidate, was the other presenter of the UW-ITE SC Seminar Series. On December 9<sup>th</sup>, 2011, he talked about his research under the topic "Development and Calibration of a Microscopic Overtaking Simulation Model" and demonstrated his work.





**City of Toronto Traffic Management Center**

## Site Visits

The Student Chapter organized two site visits during last term. First, the members had a visit to the Miovision Technologies Inc. The company is founded in 2005 by three UW graduates from systems design engineering program. The company provides new video traffic data collection technologies for different purposes including: intersection and roundabout counts; Average Daily Traffic (ADT) count; Gap study; Trip generation; ALPR/ANPR studies; OD and travel time studies; and parking study. The company was first founded at the University of Waterloo Research and Technology Park and quickly expanded within few years with two offices in Kitchener, ON, Canada, and Cologne, Germany.

The chapter also organized a visit to the City of Toronto Traffic Management Center on December 19, 2011. The center is responsible to monitor several highways in the city of Toronto using a system called RESCU. This system monitors the traffic conditions on Gardiner Expressway, Don Valley Parkway, and Lake Shore Boulevard. The RESCU system uses 935 road sensors, 73 traffic cameras, and 6 Changeable Message Signs (CMS) to detect any interruption in the traffic flow or accidents on these routes, and notify drivers by CMSs, and emergency departments to take required actions. The center is also responsible to remotely control and program traffic signals for intersections throughout the city of Toronto.



**Miovision Traffic Data Collection Technology (Left Top)  
Control Center (Left Bottom)  
RESCU Software Presentation (Above)**

## Research Activities

In order to introduce the current research topics undertaken by our members, starting from this issue, we decided to keep track of the PhD defenses and Masters seminars of graduate students in the Transportation Systems Research Group (TSRG).

### PhD Defenses

#### 1)Candidate: Yelda Turkan

Date: Thursday, April 5th, 2012

Title: Automated Construction Progress Tracking Using 3D Sensing Technologies

Supervisor: Prof. Carl T. Haas & Prof. Ralph Haas

#### 2)Candidate: Vimy Henderson

Date: Wednesday, April 4th, 2012

Title: Evaluation of Performance of Pervious Concrete Pavement in the Canadian Climate

Supervisor: Prof. Tighe

#### 3)Candidate: Marcela Alondra Chamorro Find

Date: Monday, January 30, 2012

Title: Development of a Sustainable Management System for Rural Road Networks in Developing Countries

Supervisor: Prof. Tighe

### PhD Comprehensives

#### 1)Candidate: Amin Hamdi

Date: Monday, March 19<sup>th</sup>, 2012

Title: Evaluation of the Feasibility of Using Pavement management Data to Calibrate the Mechanistic Empirical Pavement Design

Supervisor: Prof. Tighe

#### 2)Candidate: Soroush Salek Moghaddam

Date: Tuesday, January 17, 2012

Title: Performing Short Term Travel Time Predications on Arterials

Supervisor: Prof. Hellinga

### Master's Seminars

#### 1)Candidate: Maryam Shahtaheri

Date: Friday, March 23rd, 2012

Title: Setting Target Rates for Construction Activity Analysis Categories

Supervisor: Prof. Hass

#### 2)Candidate: Fei Yang

Date: Friday, January 27<sup>th</sup>, 2012

Title: Estimating Signalized Intersection Delays to Transit Vehicles from Archived AVL/APC Data

Supervisor: Prof. Hellinga



Soroush Salek (right) and Professor Bruce Hellinga (left) at Soroush's Comprehensive



Soroush Salek with friends after his Comprehensive



## Social Events

To cheer up our students in the gloomy February, we held a ten-pin bowling event in one of the local bowling arenas. Our diligent students scored points by rolling the bowling balls along the alleys while enjoying the good taste of popcorn, pizza and soda.

Now at the beginning of the May with such a great weather out there, it is time to have some outdoor social activities like BBQ and beach picnic, so stay tuned for complimentary details about these activities in our next UW-ITE newsletter.



**Members get together  
at Brunswick Bowling  
Arena**



## Professor Highlight

Jeffrey Casello



**“Professor Casello and his team are developing new ways to interact with travelers through smart phones to gather data in real time on the travelers’ satisfaction with their current trip.”**

Professor Jeff Casello loves cities and the transportation systems that make them function. Jointly appointed in the Department of Civil and Environmental Engineering and the School of Planning, Jeff’s work relies on both engineering and planning approaches to improve the design, operation and regulation of multimodal urban transportation systems. Through his teaching, research and professional activities, Professor Casello aims to create transport systems that promote economic and social vibrancy and equity, while minimizing negative environmental impacts.

Since arriving in Waterloo in 2004, Professor Casello has been engaged in research projects in many Ontario cities and internationally. The Region of Waterloo is currently planning and designing a Light Rail Transit Project with an estimated construction cost of more than \$800M. In support of this project, Professor Casello has led efforts to redesign the conventional bus network, including the development of seven upgraded bus services, known locally as “iXpress” routes. Jeff and his research team have done similar network evaluation and redesigns in Kingston and Hamilton.

In 2010, Professor Casello joined a team of consultants – Metropolitan Knowledge International and McCormick Rankin – to assess the economic impact of public transportation systems on Canada’s municipalities. This report, sponsored by the Canadian Urban Transportation Association (CUTA), determined that transit has enormously positive impacts on job growth, economic competitiveness and public health. After the release of this project, Jeff was invited to work with the cities of London and Burlington Ontario to determine strategic investment plans for the cities’ transit networks.

In the past two years, Professor Casello’s work has taken on greater international focus. In 2010, Professor Casello was invited as a subconsultant on a project in Mexico City. The State of Mexico has proposed the construction of a commuter rail line connecting the city of Chalco to Mexico City’s metro system. Jeff and his research team designed, implemented and analyzed a stated preference mode choice survey that ultimately led to a ridership forecasting model for the line. In 2011, Jeff was invited to present on the potential for high speed rail systems in North America at the Conservatoire National des Arts et Métiers (CNAM) in Paris. Later that year, UniSIM – the educational arm of Singapore’s Land Transport Authority (LTA) asked Professor Casello to provide a short course in transit planning to the agency’s aspiring managers. Also in 2011, Professor Casello and colleagues from the University of Applied Sciences in Karlsruhe Germany created an international exchange program for students at their respective universities. The first group of Waterloo students will be traveling to Karlsruhe for a week-long course in E-mobility and sustainability in the first week of June, 2012.

To balance these applied research projects, Jeff also conducts theoretical research that primarily focuses on modeling traveler behavior. Most travel forecasting models, the tools by which investments in infrastructure are evaluated, were developed to model automobile travel, with little attention to transit or non-motorized modes. Professor Casello and his team are developing new ways to interact with travelers through smart phones to gather data in real time on the travelers' satisfaction with their current trip. This research, it is expected will lead to far more robust models of how travelers choose the mode of travel as well as their destinations.

Away from the University, Professor Casello enjoys playing golf and doing home improvement. He and

his wife have just bought a 100+ year old home just one block from the proposed LRT system.



**Professor Casello operating an LRT vehicle in Karlsruhe Germany.**

## Alumni Highlight

Mike Mandelzys



**"I've been enjoying using some of my free time to really explore the nooks and crannies of Toronto."**

**Mike Mandelzys graduated in 2010, and was a student of Prof. Bruce Hellinga.**

I spent a lot of time at UW, getting both a BAsC (2006) and MASc (2010) here. I'm now living in Toronto and working as a consultant for IBI Group on Transit ITS projects around North America, especially related to fare systems and CAD/AVL deployments. It's been pretty neat since the work relates to my graduate research (using archived AVL/APC data to monitor and improve transit), and I get to work with (and sometimes travel to see) agencies around the continent.

I've been enjoying using some of my free time to really explore the nooks and crannies of Toronto. Some of my favourites have been the small farmers markets all spring and summer, diverse neighbourhoods, the festivals, all the places to bike to (everyone who comes downtown should try BIXI!), and the great little restaurants that are all around town.



# Masters Candidate Highlight

Fei Yang

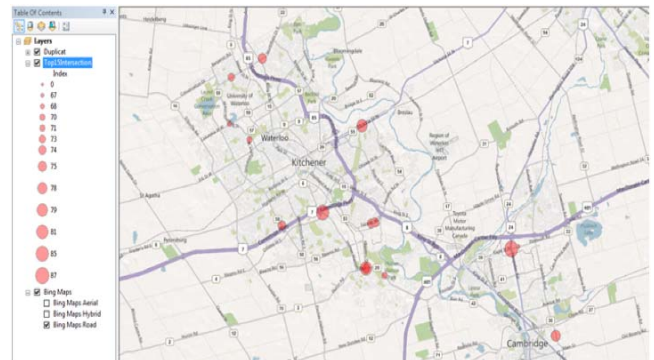
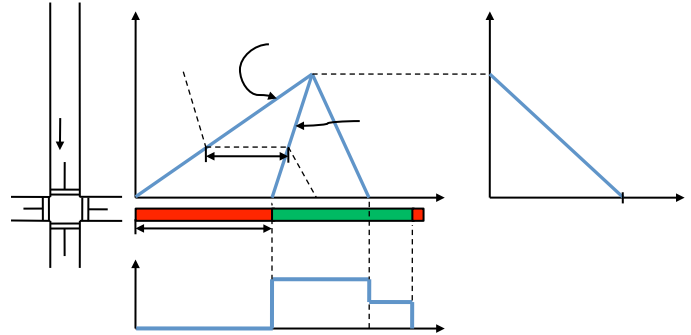
Masters Candidate

Fei Yang was a master candidate in the department of Civil and Environmental Engineering at the University of Waterloo. He was working under the supervision of Professor Bruce Hellinga. Fei finished his program at the end of 2011 and started his career as a transportation engineer with Sernas Group.

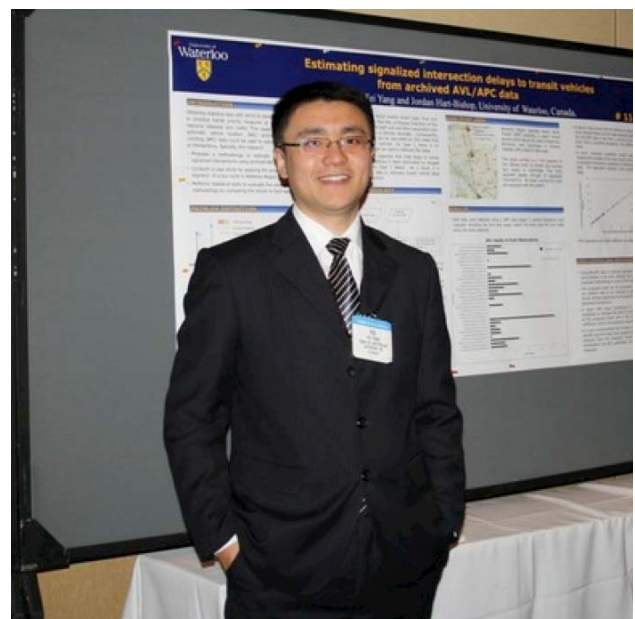
The main focus of his research was on estimating transit delays at signalized intersections using archived AVL/APC data. Signal stopped delay (spatial-temporal) patterns were investigated, which allows the Region of Waterloo to have the ability to identify potential intersections that may require transit priority measures.

Fei always enjoyed participating in University of Waterloo –Institute of Transportation Engineers Student Chapter (UW-ITE SC) events, especially seminars and social events. “These events are really great! It is always good to hear from people with different opinions and research interests within the transportation engineering field.”

Fei is married. His adorable daughter, Lauren, was born last year. Now, Fei is working hard for the honour of “best father ever” from Lauren.



**“It is always good to hear from people with different opinions and research interests within the transportation engineering field.”**





# Doctoral Candidate Highlight

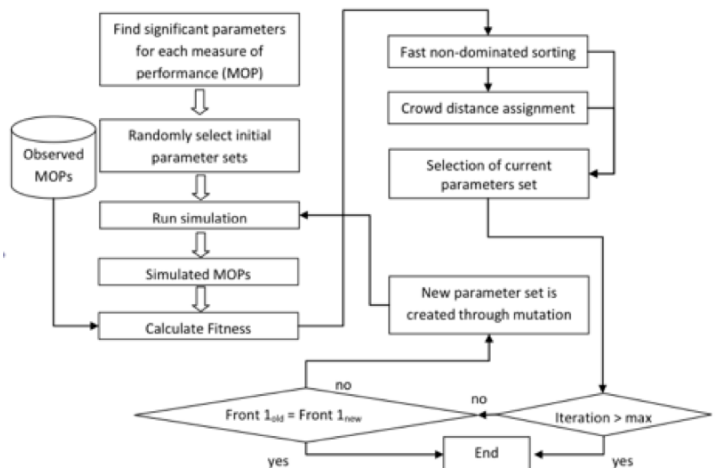
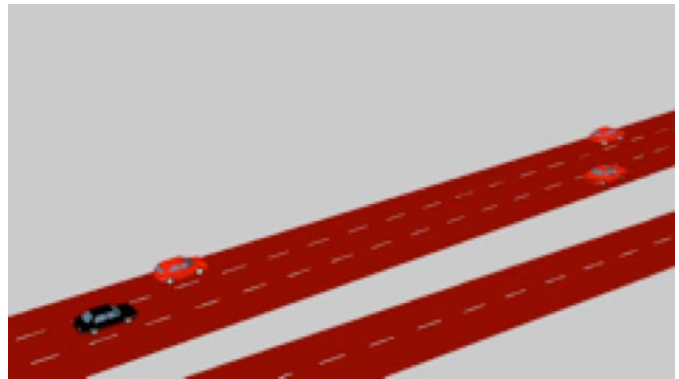
David Duong  
PhD Candidate

David is a PhD Candidate under the supervision of Dr. Saccomanno and Dr. Hellinga. His research is in the field of road safety and multi-criteria calibration of microscopic traffic simulation models. Basically, he is developing multi-criteria calibration techniques to calibrate the parameters of microscopic traffic simulation platforms (e.g. PARAMICS, VISSIM, etc.). These simulation platforms are able to replicate individual cars, pedestrians, cyclists, and transit vehicles in a virtual traffic environment and have gained acceptance for traffic operations, road safety and emissions analysis. However, any outputs are suspect from these models without adequately ensuring that the model's driver (or human) behaviour matches the real-world experience. He has 2 journal papers and 10 conference papers published to-date, and has many more in the works. David is also the first to win all three awards from the Canadian Institute of Transportation Engineering in the same year, for best presentation at the graduate level (Southwestern Ontario, Hamilton, Toronto), best student paper (Canada) and the Michel Van Aerde Memorial Scholarship (PhD level, Canada).

David currently works for IBI Group in the transit Intelligent Transportation System (ITS) practice. He is helping transit agencies (e.g. Guelph Transit, York Region Transit, London Transit Commission) deploy new ITS components. In his spare time he goes skiing and snowboarding in the winter, while in the summer he enjoys hiking, biking and camping. Going to his annual backcountry hiking/camping trip on Algonquin's Western Uplands Trail is one of his most enjoyable adventures. Nothing beats walking 15 kilometers through rough forested terrain to one's campsite, making camp alongside a pristine lake, and then watching the campfire crackle under a starry night sky. He would like to tell readers, "Always give something a try. Sometimes things work out and sometimes they do not, but at least you gave it a shot. That is how I won the three CITE scholarships!"



**"Always give something a try. Sometimes things work out and sometimes they do not, but at least you gave it a shot."**



## Project Highlight

Measuring and predicting travel times using Bluetooth detectors – answering the question “How long will it take me to get there?”

We live in the information age in which most people are plugged in and connected 24 hours of the day. We expect to be able to rapidly access information from anywhere and at any time. We can book a flight, check-in, get an e-boarding pass, and obtain turn-by-turn navigation directions from our house to the airport terminal all on our smartphone. But, we don't know how long the trip from our house to the airport will take us. We may know how long it takes on a good day, but will today be a “good” day? And if we hear on a traffic report that the highway is free flowing now, will it still be free flowing when we arrive there?

The focus of this research is on helping to fill this information void. We want to provide travellers with the travel times they will experience rather than just the conditions that exist now or have been measured in the recent past. Traffic conditions and trip travel times vary. Some of these variations follow predictable patterns, such as time of day – we know that traffic conditions become worse (and travel times increase) during the AM and PM peak commuting periods. But some of these variations are caused by random events, such as collisions, stalled vehicles, detours, unplanned road maintenance, etc.

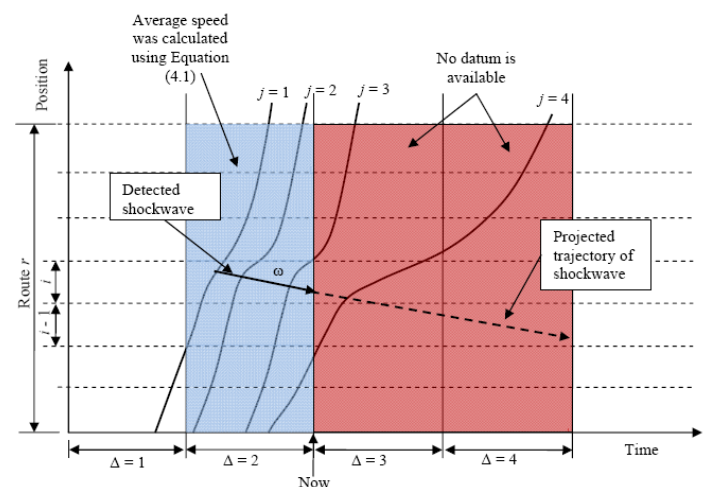
In our research we are building separate prediction models for freeways and for arterial roadways (urban roads controlled by traffic signals). These models make use of historical and real-time traffic data obtained from a variety of sensors (including loop detectors, vehicle probes, and Bluetooth detectors), as well as weather data. The real-time data are filtered to remove measurement errors and outliers and then used to identify whether or not the roadway section is currently congested or likely to become congested in the near future. The historical data are examined to identify a number of past days which experienced traffic conditions that are most similar to the conditions experienced so far today.

The current data and the historical data are combined to provide an estimate of the conditions that are likely to be experienced later in the current day.

Of course, having better predictions of traffic conditions can help travellers make better decisions; when to start their trip, what route to avoid, and even what form of transportation to use. However, these

predictions are also of value to transportation system managers. Most existing transportation management strategies, such as traffic signals, ramp meters, changeable message signs, are reactive – they respond to traffic conditions after they change. But we can get better utilization of the existing infrastructure if we implement control strategies that anticipate changes in traffic conditions before they occur. And these control strategies need to be integrated, so that we implement traffic control strategies on the freeway and parallel arterials in a coordinated fashion.

Developing a system capable of doing this in a reliable and efficient manner is a complex challenge. The first component of this system, namely the prediction of near-future traffic conditions, is currently being developed through a research project sponsored by the Ontario Ministry of Transportation. The objective is to develop and evaluate a method of providing near-future predictions of travel times for arterial and freeway segments. The project is making use of real-time travel time data being collected on several provincial highways in Waterloo Region using Bluetooth detectors, and in the Toronto area using loop detector and vehicle probe data. Early results from the project are promising and continued development and testing is underway.



# Recent Awards

Received by UW-ITE Student Chapter Members

Student	Program	Awards
Akram Nour	PhD	CITE Dr. Michel Van Aerde Memorial
Amir Ghods	PhD	CITE Student Paper Competition
Ehsan Bagheri	PhD	4th Annual Joint CITE Section Student Presentation Competition (First Prize)
Roshanak Taghipour	MASc	4th Annual Joint CITE Section Student Presentation Competition (Second Prize)
Kevin Yeung	BSc	CITE - HDR Undergraduate



Ehsan Bagheri in the 4th Annual Joint CITE Section Student Presentation Competition (First Prize)



Roshanak Taghipour in the 4th Annual Joint CITE Section Student Presentation Competition (Second Prize)

## Closing Remarks

The current executive board term will be over in the middle of May. The election announcement has been already sent out and we expect to reveal the result of this election by the end of May.

The current UW-ITE executives wish the new board a very successful year ahead.

After almost 40 years from the establishment of UW-ITE, we should measure our progress and plot our future course. Thus, along with its regular activities, the new executive board should also prepare and prioritize a strategic plan (5 year plan) which fulfills its defined goals and objectives.





# 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.

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

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

**Visit our website for more information on sponsorship opportunities.**

### Gold Level

**Want to be our sponsor?  
Be our first Gold-Level Sponsor.**

### Silver Level



**Hatch Mott  
MacDonald**

### Bronze Level





**UW-ITE Student Chapter**

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