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EDUCATION

Ph.D. in Computer Science, Telecom ParisTech, 2005

Title: Influence of traffic control in a signalized intersection on the risk of road users; Stream-based learning of safety indicators through data selection

Engineering Degree, Telecom ParisTech, 2001

Equivalent to a Master's degree in Computer Science and Engineering
Specialization in Telecommunications, Computer Science and Artificial Intelligence

FUNDING

- Co-applicant (PI Marie-Soleil Cloutier +1 researcher), Measuring the impact on road safety of speed limit changes on the Québec road network, MTMDET, 99138\$, 2017-2018
- Chercheur principal (+1 researcher), Benchmarking Mandate - The Mitigation Program of the City of Montréal, City of Montréal, 51310\$, 2017
- Co-applicant (PI Catherine Morency), Assessment of the Potential Environmental Benefits of Connected Vehicle Technology for Canada, Transport Canada, 25000\$, 2016-2017
- Co-applicant (PI Marie-Soleil Cloutier +2 chercheurs), Road Accidents at Work: What About Pedestrian Workers?, Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), 174000\$, 2016-2018
- Collaborator (PI Luis Miranda-Moreno +3 researchers), Pilot project on the safety of 4-way stop controlled intersections, Ville de Montréal, 199500\$, 2016-2018
- Collaborator (PI Luis Miranda-Moreno), Revision of the norms for variable message signs in the context of their new uses and of new technologies, MTQ, 95000\$, 2015-2017
- Principal investigator (+1 researcher), Development of a traffic data collection tool using cameras, Research contract with WSP, 6000\$, 2015
- Co-applicant (PI Guillaume-Alexandre Bilodeau +1 researcher), Development of a system for the detection and tracking of road users for adaptive traffic control, FRQNT Team Grant, 143760\$, 2015-2018
- Principal investigator, Calibration and Validation of Micro-Simulation Models, NSERC EN-GAGE program, 24750\$, 2015
- Co-applicant (PI Aliaksei Lareshyn, Lund University + 8 institutions), InDeV: In-Depth understanding of accident causation for Vulnerable road users, European Union Horizon 2020 program, 4900000 euros, 2015-2018
- Co-applicant (Bernard Gendron + 65 researchers), Centre Interuniversitaire de Recherche sur les Réseaux d'Entreprise la Logistique et le Transport (CIRRELT), Strategic Cluster Programs of the FRQNT (2448000\$) and FRQSC (450000\$), 2015-2021
- Principal investigator, Cyclist Safety at Urban Intersections, Québec Fund for Research on Nature and Technology (FRQNT) Établissement de nouveaux chercheurs universitaires, 49060\$, 2014-2016

- Principal investigator (+4 researchers), Strategy for the experimentation of intelligent speed adaptation systems and speed loggers, MTQ, 72050\$, 2014-2016
- Collaborator (PI Catherine Morency +1 researcher), Development of a tool for traffic monitoring and analysis on the MTQ road network in the greater Montreal area, MTQ, 160000\$, 2013-2016
- Collaborator (PI Luis Miranda-Moreno), Analysis of the impact of the bi-directional cycling path on Chemin de la Côte-Ste-Catherine on pedestrian and cyclist safety, City of Montréal, 25000\$, 2013-2014
- Principal investigator (+2 researchers), Microscopic data collection for the calibration and validation of traffic micro-simulation tools for highways, City of Montréal, 21000\$, 2012-2014
- Co-applicant (Luis Amador + 2 researchers), Road safety and lighting evaluation, Road Safety Research Program, FRQNT, MTQ and Québec Fund for Health Research (FRSQ), 115500\$, 2012-2015
- Principal investigator (+5 researchers), Development of a diagnosis method and action plan for road safety on the municipal road network, MTQ, 150000\$, 2012-2014
- Principal investigator (+12 researchers), Platform for Transportation Data Archiving, Processing, Analysis and Visualization, Natural Sciences and Engineering Research Council of Canada (NSERC), 115165\$, 2012
- Principal investigator, Relations of the main factors influencing pavement marking (durability and retroreflectivity), MTQ, 35000\$, 2012-2014
- Collaborator on Open 511 / 511 Ouvert, An integrated and standard framework to manage and publish road events, GeoConnections, 175000\$, 2012-2013
- Principal investigator on Pilot project for the study of the safety of all road users using video data, City of Montréal, 4700\$, 2011-2012
- Principal investigator on Literature review on retro-reflectivity issues of pavement markings, MTQ, 15000\$, 2011
- Principal investigator (+5 researchers) on Roundabout Safety in Québec, Road Safety Research Program, FRQNT-MTQ-FRQS, 150000\$, 2011-2014
- Co-applicant (PI Luis Miranda-Moreno + 4), How to improve cyclist safety at intersections and bike corridors in urban Quebec? The role of geometric design, built environment and traffic movements on cyclist injuries, Road Safety Research Program, FRQNT-MTQ-FRSQ, 150000\$, 2011-2014
- Principal investigator on Study of collision factors and processes using microscopic data, Discovery Grant, NSERC, 125000\$, 2011-2016
- Collaborator (PI Luis Miranda-Moreno + 4) on Traffic and Air Quality: Completion of Highway 25, MTQ, 2011-2014
- Co-applicant (PI François Bellavance + 32) for the Network for Research and Innovation in Road Safety, Support for Innovation Networks funded by the FRQNT, 2010-2014
- Principal investigator on Detailed accident modeling using microscopic data, grant of the Research and Innovation Directorate of Polytechnique, 15000 \$, 2010
- Principal investigator on Automated classification of accidents and interactions using microscopic data, grant for young professors of the “Fondation de Polytechnique”, 15000 \$, 2009
- Collaborator (PI Tarek Sayed) on Truck signal priority project, Transport Canada and the British Columbia Ministry of Transportation (within the Bureau for Intelligent Transportation Systems and Freight Security), 2008
- Postdoctoral Fellowship in the Department of Civil Engineering of University of British Columbia (UBC), funded in part by the Insurance Corporation of British Columbia, 2005-2008
- Ph.D. scholarship, funded by French National Institute for Transport and Safety Research (INRETS)¹ and the “région Ile de France”, 2001-2005

¹Now French institute of science and technology for transport (IFSTTAR)

AWARDS

1. Third place winner of the Transportation Association of Canada (TAC) Student Paper Award for the paper "Traffic data Collection using Thermal Camera under Varying Lighting and Temperature Conditions in Multimodal Environments" (authors: T. Fu, J. Stipanovic, S. Zangenehpour, L. Miranda-Moreno, and N. Saunier), 2016
2. Third prize of the Canadian Association of Road Safety Professionals (CARSP) Conference Student Paper Competition for the paper "Automatic Traffic Data Collection under Varying Lighting and Temperature Conditions in Multimodal Environments" (authors: T. Fu, J. Stipanovic, S. Zangenehpour, L. Miranda-Moreno, and N. Saunier), 2016
3. First prize of the Canadian Association of Road Safety Professionals (CARSP) Conference Student Paper Competition for the paper "Are Intersections with Cycle Tracks Safer? Control Case Study Based on Automated Surrogate Safety Analysis Using Video Data" (authors: S. Zangenehpour, J. Strauss, L. Miranda-Moreno, and N. Saunier), 2015
4. Second prize of the Canadian Multidisciplinary Road Safety Conference (CMRSC) Student Paper Competition for the paper "Automated Classification Based on Video Data at Intersections with Heavy Pedestrian and Bicycle Traffic: Methodology and Application" (authors: S. Zangenehpour, L. Miranda-Moreno, and N. Saunier), 2014
5. Young Researcher Award of the Transportation Research Board (TRB) Committee on Safety Data, Analysis, and Evaluation (ANB20) "Investigating Collision Factors by Mining Microscopic Data on Vehicle Conflicts and Collisions" (authors: N. Saunier, N. Mourji, and B. Agard), 2011
6. First prize of the Canadian Association of Road Safety Professionals/Insurance Bureau of Canada 2011 Student Paper Competition for the paper "Analysis of Driver Behaviour and Collision Risks for Specialized Lane Markings: Protected Freeway Entrance and Exit Ramps" (authors: P. St-Aubin, L. Miranda-Moreno, and N. Saunier), 2011
7. Young Researcher Award of the TRB Committee ANB20 for the paper "Large Scale Automated Analysis of Vehicle Interactions and Collisions" (authors: N. Saunier, T. Sayed, and K. Ismail), 2010
8. First prize of the Canadian Association of Road Safety Professionals/Insurance Bureau of Canada Student Paper Competition for the paper "Automated safety analysis using video sensors: Technology and case studies" (authors: K. Ismail, T. Sayed, and N. Saunier), 2010
9. TRB Pedestrian committee outstanding paper award for the paper "Automated Analysis Of Pedestrian-vehicle Conflicts: A Context For Before-and-after Studies" (authors: K. Ismail, T. Sayed and N. Saunier), 2010

ACADEMIC AND RESEARCH EXPERIENCE

Associate Professor

Associate Professor in Transportation at the Department of Civil, Geological and Mining Engineering of Polytechnique *June 2014 to present*

Invited Researcher

Researcher at Transport and Roads, Lund University, Sweden

February to June 2015

Invited Researcher*May 2013*

Researcher at Institut Pascal, Clermont-Ferrand, France. Collaboration on computer vision methods for transportation data collection

Assistant Professor*September 2009 to May 2014*

Assistant Professor in Transportation at the Department of Civil, Geological and Mining Engineering of Polytechnique

Research Associate*May 2005 to August 2009*

Postdoctoral Fellow till June 2008, research associate then, at the Department of Civil Engineering of UBC, Vancouver, under the guidance of Dr. Tarek Sayed. Research on Automated Road Safety Analysis Using Video Sensors.

Ph.D. Student*October 2001 to April 2005*

Ph.D. student at Telecom ParisTech and INRETS. Research in Machine Learning applied to Road Safety, dealing with the "Influence of traffic control in a signalized intersection on the risk of road users; Stream-based learning of safety indicators through data selection", supervised by Dr. Alain Grumbach and Dr. Sophie Midenet.

Engineering Intern*July to December 2000*

Intern at Advanced Telecommunication Research International, Kyoto. Research on Reinforcement Learning and the automatic tuning of meta-parameters, supervised by Dr. Kenji Doya, in Dr. Mitsuo Kawato's research group.

Other Internship*August 1997*

Intern at the Physics research centre "Laboratoire de l'Accélérateur Linéaire", Orsay, France

RESEARCH INTERESTS

- Surrogate measures of safety, i.e. that do not depend on the occurrence of accidents
- Automated traffic and road user behaviour analysis
- Information technology and intelligent transportation
- Alternative modes of transportation (walking, biking): active and vulnerable users

COURSES TAUGHT

- Traffic Flow Theory (Polytechnique, CIV6705, 2011 to 2014, 2016-2017)
- Traffic Engineering (Polytechnique, CIV8740, 2010 to 2014, 2016-2017)
- Transportation Data Management (Polytechnique, CIV8760, 2010, 2012-2016)
- Traffic Data Collection (National Course on Special Topics in Transportation Engineering, 2013)
- Surrogate Safety Analysis (National Course on Special Topics in Transportation Engineering, 2010, 2012-2013)
- Data Collection and Processing for Safety Analysis (McGill University, invited talk in CIVE-560 Transportation Safety and Design, 2011)
- Surrogate Safety Analysis (McGill University, invited talk in CIVE-546 Road and Rail Safety Analysis, 2010 and CIVE 560 Transportation Safety and Design, 2012-2013)
- Introductory Course on ITS, short presentation "The 'I' of ITS" (UBC, Vancouver, CIVL 440, Vancouver, 2007)
- Java Module, preparation of the lectures, lab work and exam, given in English (Telecom ParisTech, Master of Science, Computer Science Introductory Course, 2003, 2004)
- Initiation to Internet and the HTML language, lectures and lab work (Telecom ParisTech, Master Management and Information Technologies, 2003, 2004)

TEACHING INTERESTS

- Transportation: intelligent transportation, road safety, transportation data collection
- Computing for transportation engineering: data science, machine learning, artificial intelligence, database systems and programming languages

COLLABORATIONS AND PROFESSIONAL ORGANIZATIONS

- Member of the Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT)
- Co-head of the ITS lab of CIRRELT (with Teodor Gabriel Crainic, Université du Québec à Montréal)
- Member of the Research Chair on evaluation and implementation of sustainability in transportation of Polytechnique (MOBILITÉ Chair) led by Catherine Morency
- Initiator and member of the Committee on Traffic Modelling since 2015
- Senior associate of the Canadian Automated Vehicles Centre of Excellence (CAVCOE) since 2013
- Member of the Network for Research in Road Safety led by François Bellavance (HEC Montréal)
- Member of the expert table on Intelligent Mobility (Intelligente Transportation Systems, ITS) of the Québec Transportation Association (AQTr)
- Co-chair of paper and panel session committee of the Road Safety Standing Committee of the Transportation Association of Canada (TAC) since 2016
- Member of the committee on active transportation of the Outremont borough since 2015
- Corresponding member of the technical committee “Road Network Operations” (TC 2.1) of the World Road Association (PIARC) (2013-2015)
- Member of the consultation table on open data of the City of Montréal (2012-2013)
- Member of the TRB committees on Pedestrians (ANF10), on Safety Data, Analysis and Evaluation (ANB20) and on Artificial Intelligence and Advanced Computing Applications (ABJ70) since 2011
- Co-chair of the TRB subcommittee on surrogate measures of safety since 2013 and paper review coordinator for ANB20 since 2016

WORKSHOP ORGANIZATION, EDITOR AND REVIEWER

- Workshop organization: Human Factor Workshop at the TRB Annual Meeting on Walking at Night: the Pedestrian’s Perspective, or “The Dangers of the Night-Walkers”, Washington 2017, 1st and 2nd Workshop on Automatic Traffic Surveillance (ATS 2015 and 2016), Karlsruhe and Las Vegas, Workshop at the TRB Annual Meeting on the Comparison of Surrogate Measures of Safety Extracted from Video Data, Washington 2014, Hands on Sustainable Urban Mobility (A Canada-Germany Summer Workshop), Montréal 2013-2014, member of the organizing committee of the workshop “La ville sous nos pieds: Connaissances et pratiques favorables aux mobilités piétonnes” (COPIE) in 2013 in Montréal, joint call for paper “Modelling pedestrians and motorized traffic” sponsored by the Traffic Flow Theory and Characteristics (AHB45) and Pedestrian (ANF10) committees for the 2012 TRB Annual Meeting
- Associate Editor: editorial board member of Transactions on Transport Sciences (2016-), Journal of Modern Traffic and Transportation Engineering Research (2013-), International Journal of Automation and Logistics (Inderscience) (2012-), IEEE Intelligent Transportation Systems Magazine (2009-2011), Guest Associate Editor for the Canadian Journal of Civil Engineering (2006)
- Scientific committees: French international workshop on Pedestrian Urban Mobility 2015, Agent-based Approaches for Transportation Modelling and Optimization (AATMO’2013-

2014) Workshop, Canadian Multidisciplinary Road Safety Conference 2011, workshops organized by the integrating platform on pedestrian behaviour in its space ("plateforme intégratrice sur le Comportement du Piéton dans son Espace de circulation", COPIE) (IFSTTAR) 2011, 2013 and 2016, International Conference on Connected Vehicles & Expo (ICCVE) 2012-2015

- Reviewer
 - member of the FRQNT committee for the evaluation of the competition for Master's and Ph.D. scholarships in the field of transportation (2017-2018)
 - Research Proposals: member of the evaluation committee for a Canada Research Chair (Tier 2) at UQTR 2017, Ontario Research Fund - Research Excellence Round 8 2016, Comisión Nacional de Investigación Científica y Tecnológica (CONICYT), INICIACION 2015, Research Foundation - Flanders (FWO), Postdoctoral Fellow application 2014, NSERC Discovery grants program 2016, NSERC CRD grants program 2011, 2013, Mitacs Elevate postdoctoral fellowship program 2013, Portuguese Foundation for Science and Technology (FCT) 2012, ITS Institute at the University of Minnesota 2011, 2013, University of California Transportation Centre 2010
 - Journals: Accident Analysis & Prevention, Transaction on Transport Sciences, Transportmetrica A: Transport Science, Transportation Letters: the International Journal of Transportation Research, Traffic Injury Prevention, Journal of Transportation Safety & Security, Advances in Transportation Studies: An International Journal, ASCE Journal of Transportation Engineering, Advances in Mechanical Engineering, The Spanish Journal of Psychology, Modern Traffic and Transportation Engineering Research, Asia-Pacific Journal of Operational Research, Journal of Transportation Planning and Technology, Transportation Research Part A and C, Computer-Aided Civil and Infrastructure Engineering, Computer Vision and Image Understanding, IEEE Transactions on Pattern Analysis and Machine Intelligence, Signal Processing: Image Communication, IEEE Transactions on Intelligent Transportation Systems, IEEE Transactions on Vehicular Technology, IEEE Transactions on Neural Networks, Canadian Journal of Civil Engineering, Recherche Transport et Sécurité
 - Conferences: Transportation Research Board Annual Meeting 2006-2016, ACM/IEEE/IFAC/TRB 2012 International Conference on Connected Vehicles & Expo (ICCVE 2012-2014), 3rd International Conference of Road Safety and Simulation 2011, IEEE Conference on Intelligent Transportation Systems 2010, 2016, Congrès de l'Acfas 2010, IEEE International Conference on Acoustics, Speech, and Signal Processing 2009, 2011, International Gulf Conference on Roads 2008, IEEE International Conference on Image Processing 2006-2009, 2011, International Joint Conference on Neural Networks 2007, 2009, 2011, American Control Conference 2005-2006, IEEE Conference on Decision and Control 2004

SOFTWARE

- Traffic Intelligence: open source tools for traffic video analysis and trajectory processing
<http://bitbucket.org/Nicolas/traffickingintelligence>
- Trajectory Management and Analysis: open source tools for trajectory management and processing
<https://bitbucket.org/trajectories/trajectorymanagementandanalysis>

SKILLS

Computer

Programming languages: C/C++, Python, Java, Matlab, Gensym G2, notions of Lisp, Perl, Shell
Toolboxes/libraries: OpenCV, Boost, FLTK, Weka
Environments: Unix/Linux, MacOS, Windows
Typesetting: L^AT_EX, OpenOffice, Office, XHTML, CSS

Languages

French: Native speaker
English: Fluent
German: Good oral and written level (ZMP)
Japanese: Notions (Japanese Proficiency Test, level 4)

PUBLICATIONS

- [1] T. Fu, L. F. Miranda-Moreno, and N. Saunier. A novel framework to evaluate pedestrian safety at non-signalized locations using video-based trajectory data. *Accident Analysis & Prevention*, 2017. Submitted.
- [2] J. Stipanovic, L. F. Miranda-Moreno, and N. Saunier. Vehicle manoeuvres as surrogate safety measures: Extracting data from the gps-enabled smartphones of regular drivers. *Accident Analysis & Prevention*, 2017. Submitted.
- [3] H. Alizadeh Aliabadi, B. Farooq, C. Morency, and N. Saunier. Classifying behavioural dynamics of taxi drivers operating strategies using longitudinal route choice data. *Transportation*, 2017. Submitted.
- [4] J. Stipanovic, L. Miranda-Moreno, A. Labbe, and N. Saunier. Measuring and visualizing space-time congestion patterns in an urban road network using large-scale smartphone-collected gps data. *Transportation Letters: the International Journal of Transportation Research*, 2017. Submitted.
- [5] W. van Haperen, S. Daniels, T. De Ceunynck, N. Saunier, T. Brijs, and G. Wets. Yielding behaviour and traffic conflicts at cyclist crossing facilities on channelised right-turn lanes. *Safety Science*, 2017. Submitted.
- [6] J.-S. Bourdeau, C. Morency, and N. Saunier. Deriving parking use from household travel survey data. *Transportation Research Part A: Policy and Practice*, 2016. Submitted.
- [7] P. Rondier, M.-S. Cloutier, N. Saunier, F. Soto, and L. F. Miranda-Moreno. Road safety diagnosis and local stakeholders' knowledge: exploring spatial and thematic issues for small and medium-sized communities. *Safety Science*, 2015. Submitted in November 2015.
- [8] S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Investigating the link between bicycle boxes and cyclist profile on cyclist safety and crossing behaviour using video data. *Transportation Research Part F: Traffic Psychology and Behaviour*, 2015. Submitted.
- [9] S. Zangenehpour, T. Romancyshyn, L. F. Miranda-Moreno, and N. Saunier. Video-based automatic counting for short-term bicycle data collection in a variety of environments. *Journal of Intelligent Transportation Systems: Technology, Planning, and Operations*, 2015. Submitted.
- [10] P. Bilinski and N. Saunier. Trajectory management and analysis library. Online, 2011-2016. Software under the open source MIT License.
- [11] N. Saunier. Traffic Intelligence. Online, 2011-2016. Software under the open source MIT License.

- [12] J. Stipancic, L. F. Miranda-Moreno, and N. Saunier. The impact of congestion and traffic flow on crash frequency and severity: An application of smartphone-collected gps travel data. *Transportation Research Record: Journal of the Transportation Research Board*, 2017. Accepted. Presented at the 2017 Transportation Research Board Annual Meeting.
- [13] F. Bélisle, N. Saunier, G.-A. Bilodeau, and S. Le Digabel. Optimized video tracking for automated vehicle turning movement counts. *Transportation Research Record: Journal of the Transportation Research Board*, 2017. Accepted. Presented at the 2017 Transportation Research Board Annual Meeting.
- [14] M. Gomaa Mohamed and N. Saunier. An investigation of different geometric representations of road user volume and their impact on post-encroachment time. *Transportation Research Record: Journal of the Transportation Research Board*, 2017. Accepted. Presented at the 2017 Transportation Research Board Annual Meeting.
- [15] M. Hatzopoulou, L. F. Miranda-Moreno, C. Morency, N. Saunier, Z. Patterson, M. Trépanier, M. Shekarrizfard, J. Stipancic, A. Alam, A. Badran, J. Faucher, P. Gaudette, C. Harding, and A. Zahabi. Circulation et qualité de l'air, parachèvement de l'autoroute 25: Rapport final: Rapport général, période : 2011- 2014. Technical report, McGill University, Polytechnique Montréal and Concordia University, 2017.
- [16] H. Alizadeh Aliabadi, B. Farooq, C. Morency, and N. Saunier. On the role of bridges as anchor points in route choice modeling. *Transportation*, pages 1–26, 2017. Accepted.
- [17] W. van Haperen, S. Daniels, T. De Ceunynck, N. Saunier, T. Brijs, and G. Wets. Yielding behaviour and traffic conflicts at cyclist crossing facilities on channelised right-turn lanes. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2017. 17-01851.
- [18] H. Alizadeh Aliabadi, B. Farooq, C. Morency, and N. Saunier. Classifying behavioral dynamics of taxi drivers route choices using longitudinal gps data. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2017. 17-05190.
- [19] J. Laviolette, N. Saunier, C. Morency, and A. Lacombe. Temporal & spatial analysis of taxi demand in montréal using a clustering approach. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2017. 17-00219.
- [20] M. Nabavi Niaki, N. Saunier, and L. F. Miranda-Moreno. Analysis of cyclist behaviour at cycling network discontinuities using computer vision. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2017. 17-06043.
- [21] T. Fu, L. F. Miranda-Moreno, and N. Saunier. Novel framework to evaluate pedestrian safety at nonsignalized locations using video-based trajectory data. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2017. 17-03979.
- [22] J. Strauss, S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Cyclist deceleration rate as surrogate safety measure in montreal using smartphone gps data. *Accident Analysis & Prevention*, 99, Part A:287–296, 2017.
- [23] M. Gomaa Mohamed and N. Saunier. The impact of motion prediction methods on surrogate safety analysis: a case study of left turn and opposite direction interactions at a signalized intersection in montreal. *Journal of Transportation Safety & Security*, 2016. Accepted.
- [24] A. Lareshyn, C. Jonsson, T. De Ceunynck, Å. Svensson, M. de Goede, N. Saunier, P. Włodarek, R. van der Horst, and S. Daniels. Review of current study methods for vru safety: Appendix 6 - scoping review: surrogate measures of safety in site-based road traffic observations. Technical report, Warsaw University of Technology, Poland, 2016.

- [25] T. Fu, J. Stipanovic, S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Automatic traffic data collection under varying lighting and temperature conditions in multimodal environments: Thermal vs visible spectrum video-based systems. *Journal of Advanced Transportation*, 2017:15 pp., 2016.
- [26] J. Stipanovic, S. Zangenehpour, L. F. Miranda-Moreno, N. Saunier, and M.-A. Granié. Investigating the effects of gender on bicycle-vehicle conflicts at urban intersections using an ordered logit methodology. *Accident Analysis & Prevention*, 97:19–27, 2016.
- [27] A. Lessard, F. Bélisle, G.-A. Bilodeau, and N. Saunier. The countingapp, or how to count vehicles in 500 hours of video. In *International Workshop on Automatic Traffic Surveillance*, Las Vegas, July 2016. IEEE.
- [28] A. Laureshyn, M. de Goede, N. Saunier, and A. Fyhri. Cross-comparison of three surrogate safety methods to diagnose cyclist safety problems at intersections in Norway. *Accident Analysis & Prevention*, 2016. In Press.
- [29] T. Fu, J. Stipanovic, S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Traffic data collection using thermal camera under varying lighting and temperature conditions in multimodal environments. In *Transportation Association of Canada Conference and Exhibition*, Toronto, ON, September 2016. Third place winner of the Transportation Association of Canada (TAC) Student Paper Award.
- [30] T. Fu, L. F. Miranda-Moreno, and N. Saunier. Surrogate safety measures for crosswalk safety at nonsignalized crossings during nighttime: A Montreal case study. In *Transportation Association of Canada Conference and Exhibition*, Toronto, ON, September 2016.
- [31] T. Fu, J. Stipanovic, S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Automatic traffic data collection under varying lighting and temperature conditions in multimodal environments. In *Canadian Association of Road Safety Professionals (CARSP) Conference*, Halifax, N.S., June 2016. Third prize of the Canadian Association of Road Safety Professionals (CARSP) Conference Student Paper Competition.
- [32] E. Morin, J.-F. Bruneau, G. Bertin-Bénié, N. Saunier, N. Boujilali, É. Abraham, J. Dufort, P. Trudel, F. Bellavance, L. F. Miranda-Moreno, and F. Saad. Stratégie d’expérimentation de systèmes d’adaptation intelligente de la vitesse et d’enregistreurs de données de vitesse. Rapport final R737, Polytechnique Montréal, March 2016.
- [33] L. F. Miranda-Moreno, P. Morse, and N. Saunier. Rapport d’étape 1: Révision des normes relatives aux panneaux à messages variables en fonction du nouveau contexte d’utilisation et des nouvelles technologies utilisées. Technical report, McGill University et Polytechnique Montréal, 2016.
- [34] J.-P. Jodoin, G.-A. Bilodeau, and N. Saunier. Tracking all road users at multimodal urban traffic intersections. *IEEE Transactions on Intelligent Transportation Systems*, 17(11):3241–3251, November 2016.
- [35] T. Fu, L. F. Miranda-Moreno, and N. Saunier. Pedestrian crosswalk safety at nonsignalized crossings during nighttime. *Transportation Research Record: Journal of the Transportation Research Board*, 2586:90–99, 2016. presented at the 2016 Transportation Research Board Annual Meeting.
- [36] J.-S. Bourdeau, C. Morency, and N. Saunier. Deriving parking use from household travel survey data. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-4011.

- [37] T. Fu, J. Stipanovic, S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. A comparison of regular and thermal cameras for traffic data collection under varying lighting and temperature conditions in multimodal environments. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-2846.
- [38] L. Gauthier, N. Saunier, S. Le Digabel, and G. Cao. Calibration of driving behavior models using derivative-free optimization and video data for montreal highways. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-2988.
- [39] P. Morse, P. St-Aubin, L. F. Miranda-Moreno, and N. Saunier. Transferability study of video tracking optimization for traffic data collection and analysis. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-6810.
- [40] M. Nabavi Niaki, T. Fu, N. Saunier, L. F. Miranda-Moreno, L. Amador-Jimenez, and J.-F. Bruneau. Effects of road lighting on bicycle and pedestrian accident frequency: Case study in montreal, canada. *Transportation Research Record: Journal of the Transportation Research Board*, 2555:86–94, 2016. presented at the 2016 Transportation Research Board Annual Meeting.
- [41] M. Nabavi Niaki, N. Saunier, and L. F. Miranda-Moreno. Methodology to quantify discontinuities in a cycling network: Case study in montreal boroughs. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-5821.
- [42] O. Saoudi Hassani, N. Saunier, and C. Morency. Optimization scenarios of home-work distances in montreal, canada. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-6469.
- [43] M. Shekarrizfard, A. Alam, A. Badran, J. Faucher, L. F. Miranda-Moreno, C. Morency, N. Saunier, Z. Patterson, M. Trépanier, and M. Hatzopoulou. Validation of a puff dispersion model: Air quality simulation for new highway infrastructure. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-2419.
- [44] J. Stipanovic, L. F. Miranda-Moreno, and N. Saunier. The who and where of road safety: Extracting surrogate indicators from smartphone-collected gps data in urban environments. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-2848.
- [45] M.-A. Tessier, C. Morency, and N. Saunier. Impact of weather conditions on traffic: Case study of montreal’s winter. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2016. 16-6846.
- [46] S. Zangenehpour, J. Strauss, L. F. Miranda-Moreno, and N. Saunier. Are intersections with cycle tracks safer? Control case study based on automated surrogate safety analysis using video data. *Accident Analysis & Prevention*, 86:161–172, January 2016.
- [47] M. Hatzopoulou, L. F. Miranda-Moreno, C. Morency, N. Saunier, Z. Patterson, M. Trépanier, A. Alam, J. Faucher, M. Shekarrizfard, and J. Stipanovic. Circulation et qualité de l’air, parachèvement de l’autoroute 25: Quatrième rapport: rapport de suivi 2013-2014 troisième année d’opération: 24 mai 2013 au 23 mai 2014. Technical report, McGill University, Polytechnique Montréal and Concordia University, 2015.
- [48] N. Saunier, A. Lacoffe, J.-S. Bourdeau, and M. Trépanier. Projet de recherche portant sur les interrelations des principaux facteurs influençant ou pouvant influencer la qualité du marquage (durabilité et rétro réflexion). Rapport final, Polytechnique Montréal, October 2015.

- [49] N. Saunier, F. Soto, M.-S. Cloutier, G. Dussault, P. Rondier, R. Séguin, L. F. Miranda-Moreno, P. Morency, and F. Bellavance. Projet pilote de diagnostic et plan d'action de sécurité routière en milieu municipal. Technical report, Polytechnique Montréal and le Centre Urbanisation Culture Société de l'Institut national de la recherche scientifique (INRS), 2015.
- [50] N. Saunier, P. St-Aubin, S. Burns, M. Cano Perdomo, J.-S. Bourdeau, L. F. Miranda-Moreno, Z. Patterson, and K. Ismail. Sécurité des carrefours giratoires: Rapport final de recherche. Technical report, Polytechnique Montréal, Université McGill, Université Concordia, Université Carleton, February 2015.
- [51] A. Laureshyn, M. de Goede, N. Saunier, and A. Fyhri. Cross-comparison of three surrogate safety methods to diagnose cyclist safety problems at intersections in norway. In *4th International Cycling Safety Conference*, Hannover, September 2015.
- [52] M. Gomaa Mohamed and N. Saunier. Behaviour analysis using a multi-level motion pattern learning framework. *Transportation Research Record: Journal of the Transportation Research Board*, 2528:116–127, 2015. presented at the 2015 Transportation Research Board Annual Meeting.
- [53] A. Diallo, J.-S. Bourdeau, C. Morency, and N. Saunier. Methodology of parking analysis. *Canadian Journal of Civil Engineering*, 42(4):281–285, 2015.
- [54] S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Automated classification based on video data at intersections with heavy pedestrian and bicycle traffic: Methodology and application. *Transportation Research Part C: Emerging Technologies*, 56(0):161–176, 2015.
- [55] P. St-Aubin, N. Saunier, and L. F. Miranda-Moreno. Large-scale automated proactive road safety analysis using video data. *Transportation Research Part C: Emerging Technologies*, 58, Part B:363–379, 2015. Big Data in Transportation and Traffic Engineering.
- [56] J. Stipancic, L. F. Miranda-Moreno, and N. Saunier. Traffic parameter methods for surrogate safety: Comparative study of three non-intrusive sensor technologies. In *Canadian Association of Road Safety Professionals (CARSP) Conference*, Ottawa, ON, 2015.
- [57] T. Fu, S. Zangenehpour, L. F. Miranda-Moreno, M. S. Nabavi Niaki, N. Saunier, L. Amador, and L. Fu. Surrogate safety measures for crosswalk safety at non-signalized crossings during nighttime with the use of thermal videos: A case study in montreal. In *Canadian Association of Road Safety Professionals (CARSP) Conference*, Ottawa, ON, 2015.
- [58] S. Zangenehpour, J. Strauss, L. F. Miranda-Moreno, and N. Saunier. Are intersections with cycle tracks safer? control case study based on automated surrogate safety analysis using video data. In *Canadian Association of Road Safety Professionals (CARSP) Conference*, Ottawa, ON, 2015. First prize of the Canadian Association of Road Safety Professionals (CARSP) Conference Student Paper Competition.
- [59] L. F. Miranda-Moreno, N. Saunier, S. Zangenehpour, and T. Nosal. Analysis of the impact of the côte-ste-catherine bidirectional bicycle track on the safety of cyclists and pedestrians. Technical report, City of Montréal, 2015.
- [60] S. Burns, L. F. Miranda-Moreno, J. Stipancic, N. Saunier, and K. Ismail. Accessible and practical geocoding method for traffic collision record mapping: Quebec case study. *Transportation Research Record: Journal of the Transportation Research Board*, 2460:39–46, 2014. presented at the 2014 Transportation Research Board Annual Meeting.
- [61] M. Nabavi Niaki, N. Saunier, L. F. Miranda-Moreno, L. Amador-Jimenez, and J.-F. Bruneau. A method for road lighting audit and safety screening. *Transportation Research Record: Journal of the Transportation Research Board*, 2458:27–36, 2014. presented at the 2014 Transportation Research Board Annual Meeting.

- [62] P. Anderson-Trocme, J. Stipancic, L. F. Miranda-Moreno, and N. Saunier. Performance evaluation and error segregation of video-collected traffic speed data. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2015. 15-1337.
- [63] P. Rondier, M.-S. Cloutier, N. Saunier, F. Soto, and L. F. Miranda-Moreno. Exploring road safety analysis and stakeholder engagement for small and medium-sized communities. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2015. 15-5108.
- [64] P. St-Aubin, N. Saunier, and L. F. Miranda-Moreno. Comparison of various objectively defined surrogate safety analysis methods. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2015. 15-4629.
- [65] P. St-Aubin, N. Saunier, and L. F. Miranda-Moreno. Large-scale microscopic traffic behaviour and safety analysis of québec roundabout design. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2015. 15-5317.
- [66] S. Zangenehpour, J. Strauss, L. F. Miranda-Moreno, and N. Saunier. Are intersections with cycle tracks safer? control case study based on automated surrogate safety analysis using video data. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2015. 15-4903.
- [67] S. Zangenehpour, T. Romancyshyn, L. F. Miranda-Moreno, and N. Saunier. Video-based automatic counting for short-term bicycle data collection in a variety of environments. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2015. 15-4888.
- [68] D. Ettehadieh, B. Farooq, and N. Saunier. Systematic parameter optimization and application of automated tracking in pedestrian-dominant situations. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2015. 15-2400.
- [69] M. Hatzopoulou, L. F. Miranda-Moreno, C. Morency, N. Saunier, Z. Patterson, M. Trépanier, A. Alam, J. Faucher, M. Shekarrizfard, and J. Stipancic. Circulation et qualité de l'air, parachèvement de l'autoroute 25: Troisième rapport: rapport de suivi 2012-2013 deuxième année d'opération: 24 mai 2012 au 23 mai 2013. Technical report, McGill University, Polytechnique Montréal and Concordia University, 2015.
- [70] M.-S. Cloutier, J.-M. Auberlet, J.-F. Bruneau, A. Dommes, M.-A. Granié, S. Paquin, N. Saunier, T. Serre, and J. Torres, editors. *La ville sous nos pieds: Connaissances et pratiques favorables aux mobilités piétonnes*, Actes du 4e Colloque francophone international du GERI COPIE, Montréal, 2014. Institut national de la recherche scientifique, Centre - Urbanisation Culture Société.
- [71] J. Bélanger, C. Morency, R. Gourdeau, N. Saunier, and M. Trépanier. Avis professionnel sur les enjeux technologiques d'un système de tarification kilométrique sur le territoire de la communauté métropolitaine de montréal. Note technique pour la CMM, Polytechnique Montréal, February 2014.
- [72] M. Hatzopoulou, L. F. Miranda-Moreno, C. Morency, N. Saunier, Z. Patterson, M. Trépanier, A. Alam, A. Badran, J. Faucher, P. Gaudette, C. Harding, F. Martellozzo, and M. Shekarrizfard. Circulation et qualité de l'air, parachèvement de l'autoroute 25: Second rapport: rapport de suivi 2011-2012 première année d'opération: 24 mai 2011 au 23 mai 2012. Technical report, McGill University, Polytechnique Montréal and Concordia University, 2014. 90 p.
- [73] D. Ettehadieh, B. Farooq, and N. Saunier. Automated pedestrian trajectory data-collection and flow characterization in public spaces. In *The Conference on Pedestrian and Evacuation Dynamics 2014 (PED 2014)*, volume 2, pages 207–212, Delft, The Netherlands, October 2014.

- [74] P. St-Aubin, N. Saunier, and L. F. Miranda-Moreno. Big brother is watching you... to predict crashes. In *Big Data and Urban Informatics Workshop*, Chicago, August 2014.
- [75] S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Automated classification based on video data at intersections with heavy pedestrian and bicycle traffic: Methodology and application. In *Canadian Multidisciplinary Road Safety Conference*, Vancouver, B.C., June 2014. Second prize of the Canadian Multidisciplinary Road Safety Conference (CMRSC) Student Paper Competition.
- [76] P. Anderson-Trocme, L. F. Miranda-Moreno, and N. Saunier. Microsimulation calibration using trajectories based on image processing: from data collection to emission modeling. In *Canadian Society for Civil Engineering Annual Conference*, 2014.
- [77] J.-P. Jodoin, G.-A. Bilodeau, and N. Saunier. Urban tracker: Multiple object tracking in urban mixed traffic. In *IEEE Winter Applications of Computer Vision Conference (WACV)*, pages 885–892. IEEE, March 2014.
- [78] M. Perdomo, A. Rezaei, Z. R. Patterson, L. F. Miranda-Moreno, and N. Saunier. Pedestrian preferences with respect to roundabouts - a video-based stated preference survey. *Accident Analysis & Prevention*, 70:84–91, September 2014. Available as report reference CIRRELT-2013-82.
- [79] A. Afghari, K. Ismail, N. Saunier, A. Sharma, and L. F. Miranda-Moreno. Pedestrian-cyclist interactions at bus stops along segregated bike paths: Case study of montreal, canada. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2014. 14-5387.
- [80] M. Perdomo, A. Rezaei, Z. R. Patterson, L. F. Miranda-Moreno, and N. Saunier. Pedestrian preferences with respect to roundabouts - a video-based stated preference survey. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2014. 14-5528.
- [81] N. Saunier, H. Ardö, J.-P. Jodoin, A. Lareshyn, M. Nilsson, Å. Svensson, L. F. Miranda-Moreno, G.-A. Bilodeau, and K. Åström. Public video data set for road transportation applications. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2014. 14-2379.
- [82] N. Saunier and M. Gomaa Mohamed. Clustering surrogate safety indicators to understand collision processes. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2014. 14-2380.
- [83] P. St-Aubin, N. Saunier, and L. F. Miranda-Moreno. Road user collision prediction using motion patterns applied to surrogate safety analysis. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2014. 14-5363.
- [84] S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Automated classification in traffic video at intersections with heavy pedestrian and bicycle traffic. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2014. 14-4337.
- [85] M. Shekarrizfard, A. Alam, A. Badran, J. Faucher, L. F. Miranda-Moreno, C. Morency, Z. Patterson, N. Saunier, M. Trépanier, and M. Hatzopoulou. Assessing air quality, transport, and land use impacts of highway 25 extension in the greater montreal, canada. Poster at the Transportation Research Board Annual Meeting, 2014. P14-6202.
- [86] C. Locart, B. Agard, and N. Saunier. Analyses spatiales d'un réseau de distribution de points de vente: application à une entreprise canadienne de meubles distribués aux États-unis. *Revue Française de Gestion Industrielle*, 33(3):69–88, 2014. Presented at CIGI 2011.

- [87] N. Saunier. Roundabout safety in quebec. In *The Safety Network - The Official Newsletter of the Canadian Association of Road Safety Professionals*, volume 4, pages 7–10. Canadian Association of Road Safety Professionals, 2013.
- [88] M. Brosseau, S. Zangenehpour, N. Saunier, and L. F. Miranda-Moreno. The impact of waiting time and other factors on dangerous pedestrian crossings and violations at signalized intersections: a case study in montreal. *Transportation Research Part F: Traffic Psychology and Behaviour*, 21:159–172, 2013.
- [89] P. St-Aubin, L. F. Miranda-Moreno, and N. Saunier. An automated surrogate safety analysis at protected highway ramps using cross-sectional and before-after video data. *Transportation Research Part C: Emerging Technologies*, 36:284–295, 2013.
- [90] N. Saunier and A. Rabion. Analyse d’interactions entre usagers motorisés et non-motorisés en présence de pistes cyclables: Cas d’étude à montréal. In *Colloque International Francophone Piéton*, Montréal, QC, November 2013.
- [91] M. Gomaa Mohamed and N. Saunier. Classifying profiles of surrogate safety measures to understand collision processes. In *Canadian Multidisciplinary Road Safety Conference*, Montreal, QC, May 2013.
- [92] P. Rondier, F. Soto, M.-S. Cloutier, and N. Saunier. Méthodes de diagnostic de sécurité routière en milieu municipal: l’apport d’indicateurs médiatiques sur la perception des risques. In *Canadian Multidisciplinary Road Safety Conference*, Montreal, QC, May 2013.
- [93] M. Gomaa Mohamed and N. Saunier. The influence of motion prediction methods on surrogate safety measures. In *Canadian Society for Civil Engineering Annual Conference*, Montreal, May 2013.
- [94] M. Hatzopoulou, L. F. Miranda-Moreno, C. Morency, N. Saunier, Z. Patterson, M. Trépanier, A. Alam, A. Badran, J. Faucher, P. Gaudette, C. Harding, F. Martellozzo, and M. Shekarrizfard. Circulation et qualité de l’air, parachèvement de l’autoroute 25: Premier rapport: état de référence. Technical report, McGill University, Polytechnique Montréal and Concordia University, 2013. 110 p.
- [95] N. Saunier, F. Soto, M.-S. Cloutier, G. Dussault, P. Rondier, N. Eluru, L. F. Miranda-Moreno, P. Morency, and F. Bellavance. Projet pilote de diagnostic et plan d’action de sécurité routière en milieu municipal: Rapport d’étape 1. Technical report, Polytechnique Montréal et l’Institut National de la Recherche Scientifique, 2013.
- [96] S. Guidoin and N. Saunier. Données ouvertes et transport. *Routes et Transports*, 42(2):21–23, 2013.
- [97] G.-A. Bilodeau, J.-P. Jodoin, and N. Saunier. Change detection in feature space using binary local self-similarities. In *Canadian Conference on Computer and Robot Vision*, Regina, May 2013.
- [98] S. Burns, L. F. Miranda-Moreno, N. Saunier, and K. Ismail. Crash severity analysis at roundabouts: A case study in quebec, canada. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2013. 13-4527.
- [99] A. Diallo, C. Morency, and N. Saunier. Methodology of parking analysis. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2013. 13-2520.
- [100] S. Jackson, L. F. Miranda-Moreno, P. St-Aubin, and N. Saunier. A flexible, mobile video camera system and open source video analysis software for road safety and behavioural analysis. *Transportation Research Record: Journal of the Transportation Research Board*, 2365:90–98, 2013. presented at the 2013 Transportation Research Board Annual Meeting.

- [101] M. Gomaa Mohamed and N. Saunier. Motion prediction methods for surrogate safety analysis. *Transportation Research Record: Journal of the Transportation Research Board*, 2386:168–178, 2013. presented at the 2013 Transportation Research Board Annual Meeting.
- [102] P. St-Aubin, N. Saunier, L. F. Miranda-Moreno, and K. Ismail. Use of computer vision data for detailed driver behavior analysis and trajectory interpretation at roundabouts. *Transportation Research Record: Journal of the Transportation Research Board*, 2389:65–77, 2013. presented at the 2013 Transportation Research Board Annual Meeting.
- [103] S. Zangenehpour, L. F. Miranda-Moreno, and N. Saunier. Impact of bicycle boxes on safety of cyclists: a case study in montreal. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2013. 13-2909.
- [104] M. Gomaa Mohamed, N. Saunier, L. F. Miranda-Moreno, and S. V. Ukkusuri. A clustering regression approach: A comprehensive injury severity analysis of pedestrian-vehicle crashes in New York, US and Montreal, Canada. *Safety Science*, 54:27–37, 2013.
- [105] N. Saunier, M. Trépanier, and C. Orselli. Projet de recherche portant sur les interrelations des principaux facteurs influençant ou pouvant influencer la qualité du marquage (durabilité et rétro réflexion). Rapport d'étape, Polytechnique Montréal, 2013.
- [106] K. Ismail, T. Sayed, and N. Saunier. A methodology for precise camera calibration for data collection applications in urban traffic scenes. *Canadian Journal of Civil Engineering*, 40(1):57–67, 2013.
- [107] N. Saunier, P. Edara, and H. Baik. Transportation safety analysis. In M. Chowdhury, A. W. Sadek, G. Abu-Lebdeh, J. McBride, and B. Williams, editors, *Artificial Intelligence Applications to Critical Transportation Issues*, number E-C113 in Transportation Research Circular, pages 93–105. Transportation Research Board, November 2012. ISSN 0097-8515.
- [108] M. Brosseau, A. Carrasquilla, and N. Saunier. Pavement marking retroreflectivity in cold regions: Survey of practices. Technical report, CIRRELT, 2012. Report CIRRELT-2012-67.
- [109] S. Paquette, N. Saunier, C. Gagnon, G. Domon, J. Bergeron, J. Nortier, and S. Lacoste. Enjeux de paysage et sécurité routière en contexte de traversée d'agglomération. Rapport final. Technical report, Chaire en paysage et environnement de l'Université de Montréal, March 2013.
- [110] S. Paquette, C. Gagnon, N. Saunier, J. Bergeron, J. Nortier, and G. Domon. Integrating landscape and road safety issues for small towns' entry routes. In *Environmental Concerns in Rights-of-Way Management, 10th International Symposium*, Phoenix, Arizona, USA, 2012.
- [111] J.-P. Jodoin, G.-A. Bilodeau, and N. Saunier. Background subtraction based on local shape. Technical report, Ecole Polytechnique de Montreal, April 2012.
- [112] L. F. Miranda-Moreno, P. St-Aubin, and N. Saunier. Étude concernant l'utilisation d'une ligne continue de délimitation à gauche de la voie 1 (lcv1) vis-à-vis des entrées et des sorties d'autoroutes. Technical report, Université McGill, 2012. Réalisé pour le compte du ministère des Transports du Québec.
- [113] N. Saunier, M. Brosseau, and A. Carrasquilla. Revue de littérature et recensement auprès des administrations voisines sur l'existence d'une problématique de rétro réflexion et sur les moyens mis en place pour assurer une rétro réflexion d'une durée supérieure à une année. Technical report, Polytechnique Montréal, 2012. Réalisé pour le compte du ministère des Transports du Québec.
- [114] P. St-Aubin, L. F. Miranda-Moreno, and N. Saunier. Étude concernant l'utilisation d'une ligne continue de délimitation à gauche de la voie 1 (lcv1) vis-à-vis des entrées et des sorties d'autoroutes. *Routes et Transports*, 41(1):14–16, 2012.

- [115] B. Y. S. Khanloo, F. Stefanus, M. Ranjbar, Z.-N. Li, N. Saunier, T. Sayed, and G. Mori. A large margin framework for single camera offline tracking with hybrid cues. *Computer Vision and Image Understanding*, 116(6):676–689, 2012.
- [116] M. Brosseau, N. Saunier, K. Le Mouël, and L. F. Miranda-Moreno. The impact of traffic lights on dangerous pedestrian crossings and violations: a case study in montreal. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2012. 12-0941.
- [117] S. Li, T. Sayed, M. H. Zaki, G. Mori, F. Stefanus, B. Khanloo, and N. Saunier. Automatic collection of pedestrian data using computer vision techniques. *Transportation Research Record: Journal of the Transportation Research Board*, 2299:121–127, 2012. presented at the 2012 Transportation Research Board Annual Meeting.
- [118] P. St-Aubin, L. F. Miranda-Moreno, and N. Saunier. A surrogate safety analysis at protected freeway ramps using cross-sectional and before-after video data. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2012. 12-2955.
- [119] Y. Malinovskiy, N. Saunier, and Y. Wang. Pedestrian travel analysis using static bluetooth sensors. *Transportation Research Record: Journal of the Transportation Research Board*, 2299:137–149, 2012. presented at the 2012 Transportation Research Board Annual Meeting.
- [120] M. Goma Mohamed, N. Saunier, L. F. Miranda-Moreno, and S. V. Ukkusuri. A clustering regression approach: A comprehensive injury severity analysis of pedestrian-vehicle crashes in New York, US and Montreal, Canada. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., 2012. 12-3285.
- [121] N. Saunier and S. Midenet. Creating ensemble classifiers through order and incremental data selection in a stream. *Pattern Analysis & Applications*, 16(3):333–347, August 2013.
- [122] S. Paquette, C. Gagnon, G. Domon, N. Saunier, J. Nortier, and J. Bergeron. Enjeux de paysage et sécurité routière en contexte de traversée d’agglomération. *Activité 1, Mise à jour des connaissances, des bonnes pratiques et des expériences exemplaires*. Technical report, Chaire en paysage et environnement de l’Université de Montréal, June 2011.
- [123] C. Locart, B. Agard, and N. Saunier. Analyses spatiales d’un réseau de distribution de points de vente: application à une entreprise canadienne de meubles distribués aux États-unis. In *9^{ème} Congrès International de Génie Industriel*, Saint-Sauveur, Québec, Canada, October 2011.
- [124] S. Midenet, N. Saunier, and F. Boillot. Exposure to lateral collision in signalized intersections with protected left turn under different traffic control strategies. *Accident Analysis & Prevention*, 43(6):1968–1978, November 2011.
- [125] H. Verreault, C. Morency, and N. Saunier. Des espions gps au service de la gestion des réseaux. In *Dixièmes rencontres francophones Est-Ouest de socio-économie des transports*, Montréal, June 2011.
- [126] C. Morency, M. Trépanier, and N. Saunier. Évaluation des enjeux analytiques et des potentialités des données de temps de parcours pour mesurer la fiabilité du réseau routier montréalais, rapport final. Technical report, École Polytechnique de Montréal, May 2011.
- [127] N. Saunier, N. Mourji, and B. Agard. Using data mining techniques to understand collision processes. In *Canadian Multidisciplinary Road Safety Conference*, Halifax, N.S., May 2011. Published as Technical report CIRRELT-2011-32.
- [128] P. St-Aubin, L. F. Miranda-Moreno, and N. Saunier. Analysis of driver behaviour and collision risks for specialized lane markings: Protected freeway entrance and exit ramps. In *Canadian Multidisciplinary Road Safety Conference*, Halifax, N.S., May 2011. First prize of the Canadian Association of Road Safety Professionals/Insurance Bureau of Canada 2011 Student Paper Competition.

- [129] N. Saunier, A. El Husseini, K. Ismail, C. Morency, J.-M. Auberlet, and T. Sayed. Pedestrian stride frequency and length estimation in outdoor urban environments using video sensors. *Transportation Research Record: Journal of the Transportation Research Board*, 2264:138–147, 2011. presented at the 2011 Transportation Research Board Annual Meeting.
- [130] N. Saunier, N. Mourji, and B. Agard. Investigating collision factors by mining microscopic data of vehicle conflicts and collisions. *Transportation Research Record: Journal of the Transportation Research Board*, 2237:41–50, 2011. presented at the 2011 Transportation Research Board Annual Meeting.
- [131] K. Ismail, T. Sayed, and N. Saunier. Methodologies for aggregating traffic conflict indicators. *Transportation Research Record: Journal of the Transportation Research Board*, 2237:10–19, 2011. presented at the 2011 Transportation Research Board Annual Meeting.
- [132] N. Saunier and C. Morency. Comparing data from mobile and static traffic sensors for travel time assessment. In *T&DI Congress 2011: Integrated Transportation and Development for a Better Tomorrow. Proceedings of the First T&DI Congress 2011*, Chicago, IL, 2011. ASCE.
- [133] C. Morency, M. Trépanier, N. Saunier, and J.-P. Akélaguélo. Enhancing the value of an incidents database with an interactive visualization tool. In *T&DI Congress 2011: Integrated Transportation and Development for a Better Tomorrow. Proceedings of the First T&DI Congress 2011*, Chicago, IL, 2011. ASCE.
- [134] N. Saunier and S. Midenet. Automatic Estimation of the Exposure to Lateral Collision in Signalized Intersections using Video Sensors. Technical report, arXiv, 2010.
- [135] N. Saunier, J.-M. Auberlet, and M.-A. Granié. A study of pedestrian crossing behaviour using video sensors. Poster at the 23rd International Cooperation on Theories and Concepts in Traffic safety (ICTCT), The Hague, November 2010.
- [136] N. Saunier. *Incidence de la régulation d'un carrefour à feux sur le risque routier*. Editions Universitaires Européennes, 2010. ISBN 978-613-1-51538-5.
- [137] T. Sayed, N. Saunier, G. Lovegrove, and P. de Leur. Advances in proactive road safety planning. In *Canadian Multidisciplinary Road Safety Conference*, Niagara Falls, ON, June 2010.
- [138] K. Ismail, T. Sayed, and N. Saunier. Automated safety analysis using video sensors: Technology and case studies. In *Canadian Multidisciplinary Road Safety Conference*, Niagara Falls, ON, June 2010. First prize of the Canadian Association of Road Safety Professionals/Insurance Bureau of Canada 2010 Student Paper Competition.
- [139] B. Y. S. Khanloo, F. Stefanus, M. Ranjbar, Z.-N. Li, N. Saunier, T. Sayed, and G. Mori. Max-margin offline pedestrian tracking with multiple cues. In *Canadian Conference on Computer and Robot Vision*. IEEE, 2010.
- [140] N. Saunier, T. Sayed, and K. Ismail. Large scale automated analysis of vehicle interactions and collisions. *Transportation Research Record: Journal of the Transportation Research Board*, 2147:42–50, 2010. presented at the 2010 Transportation Research Board Annual Meeting.
- [141] K. Ismail, T. Sayed, and N. Saunier. Camera calibration for urban traffic scenes: Practical issues and a robust approach. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., January 2010. 10-2715.
- [142] K. Ismail, T. Sayed, and N. Saunier. Automated analysis of pedestrian-vehicle conflicts: Context for before-and-after studies. *Transportation Research Record: Journal of the Transportation Research Board*, 2198:52–64, 2010. presented at the 2010 Transportation Research Board Annual Meeting.

- [143] N. Saunier, K. Ismail, and T. Sayed. Camera calibration for automated road safety analysis using video sensors. Technical report, University of British Columbia, December 2009.
- [144] N. Saunier and T. Sayed. A prototype system for truck signal priority using video sensors. In *Transportation Association of Canada Conference and Exhibition*, Vancouver, B.C., October 2009.
- [145] K. Ismail, T. Sayed, and N. Saunier. Automated pedestrian safety analysis using video data in the context of scramble phase intersections. In *Transportation Association of Canada Conference and Exhibition*, Vancouver, B.C., October 2009.
- [146] N. Saunier, T. Sayed, and K. Ismail. An object assignment algorithm for tracking performance evaluation. In *Eleventh IEEE International Workshop on Performance Evaluation of Tracking and Surveillance (PETS 2009)*, pages 9–16, June 2009.
- [147] A. Tarko, G. A. Davis, N. Saunier, T. Sayed, and S. Washington. Surrogate measures of safety. White paper, ANB20(3) Subcommittee on Surrogate Measures of Safety, April 2009.
- [148] N. Saunier, K. Ismail, and T. Sayed. Automated road safety analysis: Video-based road user classification. Technical report, University of British Columbia, February 2009.
- [149] K. Ismail, T. Sayed, N. Saunier, and C. Lim. Automated analysis of pedestrian-vehicle conflicts using video data. *Transportation Research Record: Journal of the Transportation Research Board*, 2140:44–54, 2009. presented at the 2009 Transportation Research Board Annual Meeting.
- [150] K. Ismail, T. Sayed, and N. Saunier. Automated collection of pedestrian data using computer vision techniques. In *Transportation Research Board Annual Meeting Compendium of Papers*, Washington, D.C., January 2009. 09-1122.
- [151] N. Saunier, W. Kang, T. Sayed, and C. Lim. Truck signal priority. Technical report, Bureau of Intelligent Transportation Systems and Freight Security, University of British Columbia, 2008.
- [152] N. Saunier and T. Sayed. A Probabilistic Framework for Automated Analysis of Exposure to Road Collisions. *Transportation Research Record: Journal of the Transportation Research Board*, 2083:96–104, 2008. presented at the 2008 Transportation Research Board Annual Meeting.
- [153] N. Saunier and T. Sayed. Automated Road Safety Analysis Using Video Data. *Transportation Research Record: Journal of the Transportation Research Board*, 2019:57–64, 2007. presented at the 2007 Transportation Research Board Annual Meeting.
- [154] N. Saunier, T. Sayed, and C. Lim. Probabilistic Collision Prediction for Vision-Based Automated Road Safety Analysis. In *The 10th International IEEE Conference on Intelligent Transportation Systems*, pages 872–878, Seattle, October 2007. IEEE.
- [155] N. Saunier and T. Sayed. Clustering Vehicle Trajectories with Hidden Markov Models. Application to Automated Traffic Safety Analysis. In *International Joint Conference on Neural Networks*, pages 4132–4138, Vancouver, July 2006. IEEE.
- [156] N. Saunier and T. Sayed. A feature-based tracking algorithm for vehicles in intersections. In *Canadian Conference on Computer and Robot Vision*, Québec, June 2006. IEEE.
- [157] N. Saunier and T. Sayed. Automated Road Safety Analysis Using Video Sensors. Technical report, University of British Columbia, 2006.
- [158] N. Saunier. *Incidence de la régulation d'un carrefour à feux sur le risque des usagers. Apprentissage d'indicateurs par sélection de données dans un flux*. PhD thesis, ENST Paris, June 2005. ENST 2005 E 011.

- [159] N. Saunier, S. Midenet, and A. Grumbach. Stream-based Learning through Data Selection in a Road Safety Application. In E. Onaindia and S. Staab, editors, *STAIRS 2004, Proceedings of the Second Starting AI Researchers' Symposium*, volume 109 of *Frontiers in Artificial Intelligence and Applications*, pages 107–117, Valencia, Spain, August 2004. IOS Press.
- [160] N. Saunier, S. Midenet, and A. Grumbach. Coopération entre système d'inférence et système de reconnaissance; détection de situations dangereuses dans un carrefour à feux. *Génie Logiciel*, 71:20–24, December 2004.
- [161] N. Saunier, S. Midenet, and A. Grumbach. Apprentissage incrémental par sélection de données dans un flux pour une application de sécurité routière. In M. Liquière and M. Sebban, editors, *Conférence d'Apprentissage*, pages 239–251, Montpellier, June 2004. PUG.
- [162] N. Saunier, S. Midenet, and A. Grumbach. Automatic detection of vehicle interactions in a signalized intersection. In *16th International Cooperation on Theories and Concepts in Traffic Safety Workshop*, Soesterberg, The Netherlands, October 2003.
- [163] N. Saunier. Interactions multimodales et mondes virtuels. Mémoire de 3^{ème} année à l'ENST, Paris, July 2001.
- [164] N. Saunier. Automatic adaptation of learning parameters in reinforcement learning. Internship report, ATR International, Japan, December 2000.

INVITED TALKS

1. Voitures autonomes et systèmes de transport intelligents: une réalité à laquelle les villes doivent se préparer, Smart City Conference (3rd edition), Les Affaires newspaper, Montréal, October 20th 2016
2. Les technologies pour la sécurité routière de tous les usagers, présentation à la table d'expertise en sécurité routière de l'AQTr, Montréal, September 8th 2016
3. Quelles technologies embarquées pour la mesure et le contrôle de la vitesse?, Colloque AQTr: Des stratégies gagnantes pour mieux gérer la vitesse, Montréal, May 25th 2016
4. La révolution autonome, Panel sur les technologies et l'avenir de l'automobile, Montréal Science Centre, January 15th 2016
5. Automated Methods for Traffic Data Collection and Surrogate Measures of Safety, IMOB Transportation Research Institute, Hasselt University, March 19th 2015
6. Automated Methods for Traffic Data Collection and Surrogate Measures of Safety, Chair of Traffic Engineering and Control, Technische Universität München, March 11th 2015
7. Video Analysis for Cyclist Safety: Case Studies in Montreal, Canada, Workshop on Bicycle infrastructure design and interplay in traffic, Oslo, February 26th 2015
8. Automated Road Safety Analysis, Department meeting, Transport and Roads, Lund University, February 23rd 2015
9. Morningside Avenue Traffic Safety Analysis Results, Webinar for the New York City Department of Transportation, February 17th 2015
10. In-vehicle Technologies for Speed Management and Road Safety, Workshop "Car Insurance and Behaviour Management", chaire d'acturiat, Laval University, February 5th 2015
11. Automated Methods for Surrogate Safety Analysis: Where We Are and Where to Go Next, Keynote speech at the 2014 ICTCT Workshop, University of Applied Science in Karlsruhe, October 16th 2014

12. Why Transportation (Engineering)?, Student Day at the Annual Conference of the Transportation Association of Canada, invited by the Ontario Good Roads Association, September 30th 2014
13. Automated Methods for Surrogate Safety Analysis, Webinar for the District Department of Transportation, August 25th 2014
14. Informations libres: qu'en pensent nos chercheurs?, 13ème journée de la recherche de Polytechnique Montréal, May 29th 2014
15. Automated Road Safety Analysis using Video Data Montreal Students' Chapter - Canadian Transportation Research Forum Conference, April 7th 2014
16. Automated Methods for Surrogate Safety Analysis, Webinar for the New York City Department of Transportation, February 24th 2014
17. Understanding Collision Processes using Video Data, TRB Workshop on Comparison of Surrogate Measures of Safety Extracted from Video Data, January 12th 2014
18. Automated Surrogate Road Safety Analysis, Concordia Institute for Information Systems Engineering (CIISE) Distinguished Seminar Series, November 14th 2013
19. Diagnostic de sécurité routière à l'aide de données vidéo, IFFSTAR-ENTPE Seminar, May 22nd 2013
20. Diagnostic de sécurité routière à l'aide de données vidéo, Institut Pascal Seminar, May 14th 2013
21. Analyse de la sécurité des carrefours giratoires au Québec, 48ème Congrès de l'AQTr, March 25th 2013
22. Member of the panel of the AQTr workshop "Les STI intégrés: enjeux et perspectives", February 7th 2013
23. Open Source Tools for Trajectory Data Analysis, Workshop on Big Data Informatics: Innovations in Mining Structured and Unstructured Information for Mobility Decision-Making, TRB Workshop 124, January 13th 2013
24. Open source tools for trajectory data analysis, ITS Canada Annual Conference, Québec, June 13th 2012
25. A Surrogate Safety Analysis at Protected Freeway Ramps Using Cross-Sectional and Before-After Video Data, ITS Canada Annual Conference, Québec, June 12th 2012
26. The Driverless Revolution, annual workshop of the research chair on mobility (Polytechnique), Montréal, May 23rd 2012
27. Analyse proactive de la sécurité routière et traitement d'image, annual workshop of the Network for Research in Road Safety, Laval University, May 22nd 2012
28. Utilisation de la vidéo pour l'analyse automatique des conflits entre usagers de la route, Colloque AQTr: Les technologies en sécurité routière, Montréal, November 29th 2011
29. Using Data Mining Techniques to Understand Collision Processes, Canadian Multidisciplinary Road Safety Conference, Halifax, Nova Scotia, May 9th 2011
30. Collecte de données sur les mouvements et la sécurité des piétons par caméra vidéo, 46ème Congrès de l'AQTr, April 12th 2011

31. ITS for Transportation Data Collection and Road Safety Analysis; Integrated Platform for Transportation Data Analysis, presentation of CIRRELT to Transport Canada, February 11th 2011
32. Investigating collision factors by mining microscopic data of vehicle conflicts and collisions, Transportation Research Board Annual Meeting, Washington, D.C., January 26th 2011
33. Member of the panel of the TRB workshop entitled "Place of Artificial Intelligence and Computation in the Complex World of Transportation", January 23rd 2011
34. Automated Road Safety Analysis using Video Sensors, TRAM & CIRRELT weekly transportation seminar, November 25th 2010
35. Automated Proactive Road Safety Analysis, University of Connecticut, November 1st, 2010
36. Collecte de données sur les mouvements des piétons par caméra vidéo: application à la sécurité routière, seminar of the integrating platform on pedestrian behaviour in its space ("COMportement du PIéton dans son Espace de circulation") (COPIE), July 2nd 2010
37. Méthodes automatiques pour l'analyse proactive de la sécurité routière, 45ème Congrès de l'AQTr, March 30th 2010
38. How Many Ways to Crash, invited presentation in the Session on Developments in Alternative Models for Road Safety, Transportation Research Board Annual Meeting, Washington, D.C., January 13th, 2010
39. Large Scale Automated Analysis of Vehicle Interactions and Collisions, Session on Varied Approaches to Road Safety Assessment, Transportation Research Board Annual Meeting, Washington, D.C., January 12th, 2010
40. A prototype system for truck signal priority using video sensors, 2009 Transportation Association of Canada Annual Meeting, Vancouver, October 19th 2009
41. Truck Signal Priority (with Wook Kang), 2009 ITE Quad Conference, Vancouver, May 2nd 2009
42. Presentations on Road Safety Analysis (with Kareem El-Basyouny and Karim Ismail) and Video-based Transportation Data Collection (with Karim Ismail) at a joint Transportation Symposium of the University of British Columbia and University of Washington, Seattle, April 3rd 2009
43. Surrogate Safety Analysis, Surrogate Measures of Safety Subcommittee (ANB20(3)), Transportation Research Board Annual Meeting, Washington, D.C., January 13th 2009
44. Vision-Based Road Safety Analysis, 2008 Canadian Institute of Transportation Engineers (CITE) Annual Conference, Victoria, April 30th, 2008
45. Vision-based Road Safety Analysis, invited talk at the SFU Vision and Media Lab with professor Greg Mori, Vancouver, September 12th, 2007
46. Automated Road Safety Analysis Based on Video Sensors, Meeting with Christer Hydén and Åse Svensson, UBC, Vancouver, June 28th, 2007
47. Automated Road Safety Analysis Using Video Data, Translink, Vancouver, January 29th, 2007
48. Vehicle Trajectories Clustering with Dynamic Bayesian Networks for Traffic Safety Analysis, ITS Canada Annual Conference, Whistler, June 5th, 2006
49. Automated Road Safety Analysis Using Video Sensors, UBC Laboratory for Computational Intelligence Forum, Vancouver, April 24th, 2006

50. Clustering automatique de trajectoires avec des HMMs; Application à la sécurité du trafic routier, Séminaire Machine Learning ENST, Paris, January 9th, 2006
51. Automated Road Safety Analysis Using Video Sensors, UBC Transportation Seminar, Vancouver, September 15th, 2005
52. Stream-Based Learning through Data Selection in a Road Safety Application, STAIRS 2004, Valencia, June 24th, 2004
53. Coopération entre système d'inférence et système de reconnaissance; Détection de situations dangereuses dans un carrefour à feux, Forum NTIC et Transports sur le Soft Computing & Transports, Paris, June 27th, 2004
54. Apprentissage incrémental par sélection de données dans un flux pour une application de sécurité routière, Conférence Cap 2004, Montpellier, June 14th, 2004
55. Automatic detection of vehicle interactions in a signalized intersection, 16th Workshop of the International Cooperation on Theories and Concepts in Traffic safety, Soesterberg, October 30th, 2003