

# Nicolas Saunier

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## EDUCATION

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### **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

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- Co-investigator (PI Brunilde Sansò +1 researcher), Machine experience in an IoT / smart-city environment, Collaborative Research and Development Grant, NSERC, 328151\$, 2018-2021
- Principal investigator (+4 researchers), Fundamental Challenges for Big Data Fusion and Strategic Transportation Planning, Fundamental Research Funding Program, IVADO, 139500\$, 2018-2019
- Co-investigator (PI Guillaume-Alexandre Bilodeau +2 researchers), Road user tracking and trajectory clustering for intelligent transportation systems, Fundamental Research Funding Program, IVADO, 130500\$, 2018-2019
- Collaborator (Marc-André Tousignant, CIMA+), Position of the City of Montréal on connected and autonomous vehicles in the context of the update of the 2008 transportation plan, City of Montréal, 54000\$, 2017
- Co-investigator (PI Guillaume-Alexandre Bilodeau), Detection and classification of road users for video surveillance applications, Collaborative Research and Development Grant, NSERC, 80700\$
- Principal investigator, More than transportation : An integrated framework to evaluate how streets serve all users, Discovery Grant, NSERC, 255000\$, 2017-2022 (+ Discovery Accelerator Supplement, 120000\$, 2017-2020)
- Co-applicant (PI Marie-Soleil Cloutier +1 researcher), Measuring the impact on road safety of speed limit changes on the Québec road network, MTMDDET, 99138\$, 2017-2018
- Principal investigator (+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€, 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
- Co-applicant (PI Catherine Morency +3 researchers), Technical note on the technological stakes of a traveled distance tax in the region of the Montréal Metropolitan Community, Montréal Metropolitan Community, 25000\$, 2014
- 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, Open 511 / 511 Ouvert, An integrated and standard framework to manage and publish road events, GeoConnections, 175000\$, 2012-2013
- Principal investigator, Pilot project for the study of the safety of all road users using video data, City of Montréal, 4700\$, 2011-2012
- Principal investigator, Literature review on retro-reflectivity issues of pavement markings, MTQ, 15000\$, 2011
- Principal investigator (+5 researchers), 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, FQRNT-MTQ-FRSQ, 150000\$, 2011-2014

- Principal investigator, Study of collision factors and processes using microscopic data, Discovery Grant, NSERC, 125000\$, 2011-2016
- Collaborator (PI Luis Miranda-Moreno + 4), 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, Detailed accident modeling using microscopic data, grant of the Research and Innovation Directorate of Polytechnique, 15000 \$, 2010
- Principal investigator, Automated classification of accidents and interactions using microscopic data, grant for young professors of the “Fondation de Polytechnique”, 15000 \$, 2009
- Collaborator (PI Tarek Sayed), 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)<sup>1</sup> and the “région Ile de France”, 2001-2005

## AWARDS

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1. Participant in the Future Leaders Program of the 2017 Science and Technology for Society (STS) Forum in Kyoto
2. Third prize of the Canadian Association of Road Safety Professionals (CARSP) Conference Student Paper Competition for the paper “A Novel Framework to Evaluate Yielding Behavior and Crossing Decisions at Non-signalized Locations using Video-based Trajectory Data” (authors : T. Fu, L. Miranda-Moreno, and N. Saunier), 2017
3. First prize of the student journal paper competition from the Québec Road Safety Research Network (RRSR) for “Automatic Traffic Data Collection under Varying Lighting and Temperature Conditions in Multimodal Environments : Thermal vs Visible Spectrum Video-Based Systems” published in the Journal of Advanced Transportation by T. Fu, J. Stipanovic, S. Zangenehpour, L. Miranda-Moreno, and N. Saunier in 2017 and third place for “Investigating the Effects of Gender on Bicycle-Vehicle Conflicts at Urban Intersections Using an Ordered Logit Methodology” published in Accident Analysis & Prevention by J. Stipanovic, S. Zangenehpour, L. F. Miranda-Moreno, N. Saunier and M.-A. Granié in 2016
4. 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
5. 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
6. 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
7. 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

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

8. 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
9. 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
10. 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
11. 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
12. 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

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### Associate Professor

*June 2014 to present*

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

### Invited Researcher

*February to June 2015*

Researcher at Transport and Roads, Lund University, Sweden

### 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

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- 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

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- 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

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- 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

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- Member of the Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT) since 2011, and co-head of the ITS lab of CIRRELT (with Teodor Gabriel Crainic, Université du Québec à Montréal) since 2012
- Member of the Institute for Data Valorization (IVADO)
- Member of the Research Chair on evaluation and implementation of sustainability in transportation of Polytechnique (MOBILITÉ Chair) led by Catherine Morency since 2010
- Member of the Academic Council of Polytechnique since 2015
- Senior associate of the Canadian Automated Vehicles Centre of Excellence (CAVCOE) since 2013
- Member of the Québec Road Safety Research Network (RRSR) since 2010
- Member of the expert table on Intelligent Mobility (Intelligent Transportation Systems, ITS) of the Québec Transportation Association (AQTr)
- Co-chair of the SAE International committee on Surrogate Measures of Safety since 2017
- Member of the TRB committees on Pedestrians (ANF10) and on Safety Data, Analysis and Evaluation (ANB20) since 2011

- Member of the TRB committee on Artificial Intelligence and Advanced Computing Applications (ABJ70) (2011-2017)
- Co-chair of the TRB subcommittee on surrogate measures of safety since 2013 and paper review coordinator for ANB20 since 2016
- 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
- Initiator and member of the Committee on Traffic Modelling (2015-2016)
- 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)

## **WORKSHOP ORGANIZATION, EDITOR AND REVIEWER**

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- Workshop organization : AQTr workshop on automated vehicles 2018, 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 IATSS Research (2018-), Transactions on Transport Sciences (2016-), 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 Meeting on Transport and Mobility (RFTM) (2018), Canadian Multidisciplinary Road Safety Conference (now CARSP) since 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, French international workshop on Pedestrian Urban Mobility 2015, Agent-based Approaches for Transportation Modelling and Optimization (AATMO'2013-2014) Workshop, International Conference on Connected Vehicles & Expo (ICCVE) 2012-2015
- Reviewer
  - Student Scholarships : 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, student scholarship program of AQTr (Master's) 2017, TAC Graduate Student Scholarships 2013-2017
  - Research Proposals : Institut de Valorisation des données (IVADO) projets de recherche fondamentale 2017, Agence Nationale de la Recherche (ANR) PRCE France 2017, Israel Science Foundation (ISF) 2017, 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 2016-2017, 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, Trans-

- portmetrica A : Transport Science, Journal of Advanced Transportation, 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 : ASCE International Conference on Transportation & Development 2018, Transportation Research Board Annual Meeting 2006-2018, 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

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- 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

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### 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 :  $\LaTeX$ , 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

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- [1] J.-F. Bruneau, N. Saunier, and C. Morency. Safety and mobility in pedestrian priority zones. *Journal of Transportation Engineering, Part A : Systems*, 2017. Submitted.
- [2] H. Alizadeh Aliabadi, B. Farooq, C. Morency, and N. Saunier. Frequent versus occasional drivers : A hybrid route choice model. *Transportation Research Part F : Traffic Psychology and*

*Behaviour*, 2018. Submitted. Presented at the 2018 Transportation Research Board Annual Meeting.

- [3] H. Alizadeh Aliabadi, N. Saunier, C. Morency, and B. Farooq. Determinants of drivers' consideration set size : A study of revealed preferences. *Transportation Research Part F : Traffic Psychology and Behaviour*, 2017. Submitted.
- [4] T. De Ceunynck, C. Johnsson, A. Lareshyn, Å. Svensson, M. de Goede, R. van der Horst, N. Saunier, P. Włodarek, and S. Daniels. The use of surrogate measures of safety in site-based observations of road traffic : a scoping review. *Accident Analysis & Prevention*, 2017. Submitted.
- [5] H. Alizadeh Aliabadi, B. Farooq, C. Morency, and N. Saunier. Classifying behavioural dynamics of taxi drivers operating strategies using longitudinal route choice data. *Transportation Research Part F : Traffic Psychology and Behaviour*, 2017. Submitted. Presented at the 2017 Transportation Research Board Annual Meeting.
- [6] M. Nabavi Niaki, N. Saunier, and L. F. Miranda-Moreno. Cyclist behaviour at discontinuities in the cycling facility : computer vision technique on video data. *Transactions on Transport Sciences*, 2018. Submitted.
- [7] P. Bilinski and N. Saunier. Trajectory management and analysis library. Online, 2011-2018. Software under the open source MIT License.
- [8] N. Saunier. Traffic Intelligence. Online, 2011-2018. Software under the open source MIT License.
- [9] 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*, 115 :160–169, 2018.
- [10] 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. *Transportation Research Part F : Traffic Psychology and Behaviour*, 2018. Accepted.
- [11] 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*, 111 :23–33, 2018.
- [12] H. Alizadeh Aliabadi, C. Morency, B. Farooq, and N Saunier. Are we really utility maximizers? a route choice perspective. In *15th International Conference on Travel Behavior Research*, 2018.
- [13] N. Saunier, P. Nouri, F. Bélisle, and C. Morency. Evaluating the impacts of connected vehicles on ghg emissions : How to transfer the results from the literature. Technical Report CIRRELT-2018-11, CIRRELT, 2018.
- [14] D.-A. Beaupre, G.-A. Bilodeau, and N. Saunier. Improving multiple object tracking with optical flow and edge preprocessing. In *First International Conference on Pattern Recognition and Artificial Intelligence*, Montréal, May 2018.
- [15] M. Urdaneta, A. Lemay, N. Saunier, and J. M. Fernandez. A cyber-physical test bed for measuring the impacts of cyber attacks on urban road networks. In *Twelfth IFIP WG 11.10 International Conference on Critical Infrastructure Protection*, Arlington, Virginia, March 2018.
- [16] M.-A. Tousignant, M. Côté, K. Kalache, M. Barnet, N. Saunier, and F. Bélisle. Services professionnels pour la ville de montréal face à la question des véhicules connectés et autonomes dans le cadre de la mise à jour du plan de transport 2008. Technical report, Ville de Montréal, 2018.
- [17] P. St-Aubin, B. Ledezma-Navarro, A. Labbe, T. Fu, N. Saunier, and Miranda-Moreno L. F. Speed at partially and fully stop-controlled intersections. In *Transportation Research Board Annual Meeting Compendium of Papers*, 2018. 18-05438.



- [18] J. Stipančic, L. F. Miranda-Moreno, N. Saunier, and A. Labbe. Network screening for large urban road networks : Using gps data and surrogate measures to model crash frequency and severity. In *Transportation Research Board Annual Meeting Compendium of Papers*, 2018. 18-02836.
- [19] H. Alizadeh Aliabadi, B. Farooq, C. Morency, and N. Saunier. Frequent versus occasional drivers : A hybrid route choice model. In *Transportation Research Board Annual Meeting Compendium of Papers*, 2018.
- [20] F. Bélisle, N. Saunier, and O. Audet. Continuous tracking : exploring the long-term value of bluetooth. In *Transportation Research Board Annual Meeting Compendium of Papers*, 2018. 18-05475.
- [21] H. Alizadeh Aliabadi, C. Morency, N. Saunier, and B. Farooq. Factors affecting drivers' consideration set of route alternatives. In *Transportation Research Board Annual Meeting Compendium of Papers*, 2018. 18-05374.
- [22] T. Fu, D. Beitel, B. Ledezma-Navarro, S. A. Zahabi, N. Saunier, and L. F. Miranda-Moreno. Investigating cyclist-pedestrian interactions at bus stops and non-signalized intersections using a distance-velocity model and speed measures derived from video data. In *Transportation Research Board Annual Meeting Compendium of Papers*, 2018. 18-05083.
- [23] N. Saunier, F. Bélisle, P. Nouri, and C. Morency. Les véhicules connectés auront-ils un impact sur les émissions de gaz à effet de serre? *Routes et Transports*, 46(2) :47–51, October 2017.
- [24] J. Stipančic, L. F. 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*, pages 1–11, 2017. Online. Green OA (Poly).
- [25] H. Alizadeh Aliabadi, P.L. Bourbonnais, C. Morency, B. Farooq, and N. Saunier. An online survey to enhance the understanding of car drivers route choices. In *International Conference on Transport Survey Methods*, September 2017.
- [26] A. Chang, N. Saunier, and A. Laureshyn. Proactive methods for road safety analysis. Technical Report WP-0005, SAE International, October 2017.
- [27] M. Gomaa Mohamed and N. Saunier. Applications of multi-level pattern learning to traffic scene interpretation and anomaly detection. Technical Report CIRRELT-2017-48, CIRRELT, 2017.
- [28] J. Stipančic, L. F. Miranda-Moreno, N. Saunier, and A. Labbe. Surrogate safety and network screening : Modelling crash frequency using gps data and latent gaussian models. In *Transportation Association of Canada Conference and Exhibition*, 2017. First place winner of the Transportation Association of Canada (TAC) Student Paper Award.
- [29] T. Fu, L. F. Miranda-Moreno, and N. Saunier. A novel framework to evaluate yielding behavior and crossing decisions at non-signalized locations using video-based trajectory data. In *Canadian Association of Road Safety Professionals (CARSP) Conference*, 2017. Third prize of the Canadian Association of Road Safety Professionals (CARSP) Conference Student Paper Competition.
- [30] P. St-Aubin, N. Saunier, L. F. Miranda-Moreno, and A. Laureshyn. Microscopic road safety comparison between canadian and swedish roundabout driver behaviour. In *Canadian Association of Road Safety Professionals (CARSP) Conference*, 2017.
- [31] P. St-Aubin, N. Saunier, and L. F. Miranda-Moreno. Surrogate safety analysis of quebec roundabout design. In *Canadian Association of Road Safety Professionals (CARSP) Conference*, 2017.
- [32] A. Laureshyn, C. Johnsson, T. Madsen, A. Varhelyi, M. de Goede, Å. Svensson, N. Saunier, and W. van Haperen. Validation of surrogate safety measures with focus on vulnerable road users. In *Road Safety & Simulation Conference*, 2017.

- [33] W. van Haperen, M. Riaz, S. Daniels, N. Saunier, T. Brijs, and G. Wets. Observing the observation of road user behavior : A scoping review to gain insights into current practices. In *Road Safety & Simulation Conference*, 2017.
- [34] C. Morency, N. Saunier, P. Nouri, and F. Bélisle. Évaluation des bénéfices environnementaux potentiels des véhicules connectés au canada. Rapport final, Polytechnique Montréal, 2017. Réalisé pour le compte de Transports Canada.
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## INVITED TALKS

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1. Les voitures autonomes, Colloque sur la mobilité des aînés, January 25th 2018
2. State-of-Practice of Surrogate Measures of Safety, SIS118 - Stop Waiting for Crashes to Occur : Video Analytics for Road Safety Analysis, ITS World Congress, Montréal, November 2nd 2017
3. Les voitures autonomes : Quel impact sur la mobilité de demain?, Midis-discussions durables, Polytechnique Montréal, october 18th 2017
4. Monitoring Transportation Systems : Everyone Here or A Few Everywhere, Smart City X, Montréal, September 23rd 2017
5. Levels of Automation, Panel Discussion I - Automated Vehicle Technology and Road Safety, CARSP Conference, Toronto, June 18th 2017
6. L'Internet des objets, presentation to the expert table on smart mobility of AQTr, Montréal, June 6th 2017
7. Smart Mobility with Artificial Intelligence, C2MTL, Montréal, May 25th 2017
8. Impacts des aménagements cyclables sur les comportements et la sécurité des cyclistes (with Luis Miranda-Moreno), Annual workshop of the Québec Road Safety Research Network, Québec City, May 18th 2017
9. Applications of artificial intelligence in transportation, annual workshop of the research chair on mobility, Polytechnique Montréal, May 2nd 2017
10. Smart Cities, Mission industrielle : Poly-Monde, Polytechnique Montréal, March 31st 2017
11. How to Evaluate all the Functions of Streets?, invited seminar, University of Connecticut, March 27th 2017
12. Quelles technologies embarquées pour la mesure et le contrôle de la vitesse?, Colloque Facteurs humains, technologies embarquées et numériques : Quel rôle pour les politiques de sécurité routière?, Entretiens Jacques Cartier, Lyon, november 23rd 2016

13. 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
14. Les technologies pour la sécurité routière de tous les usagers, presentation to the expert table on road safety of AQTr, Montréal, September 8th 2016
15. 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
16. La révolution autonome, Panel sur les technologies et l'avenir de l'automobile, Montréal Science Centre, January 15th 2016
17. Automated Methods for Traffic Data Collection and Surrogate Measures of Safety, IMOB Transportation Research Institute, Hasselt University, March 19th 2015
18. Automated Methods for Traffic Data Collection and Surrogate Measures of Safety, Chair of Traffic Engineering and Control, Technische Universität München, March 11th 2015
19. Video Analysis for Cyclist Safety : Case Studies in Montreal, Canada, Workshop on Bicycle infrastructure design and interplay in traffic, Oslo, February 26th 2015
20. Automated Road Safety Analysis, Department meeting, Transport and Roads, Lund University, February 23rd 2015
21. Morningside Avenue Traffic Safety Analysis Results, Webinar for the New York City Department of Transportation, February 17th 2015
22. In-vehicle Technologies for Speed Management and Road Safety, Workshop "Car Insurance and Behaviour Management", chaire d'actuariat, Laval University, February 5th 2015
23. Revue des programmes d'assurance télématique au Québec, Table québécoise de sécurité routière, Québec City, October 30th 2014
24. 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
25. 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
26. Automated Methods for Surrogate Safety Analysis, Webinar for the District Department of Transportation, August 25th 2014
27. Informations libres : qu'en pensent nos chercheurs?, 13ème journée de la recherche de Polytechnique Montréal, May 29th 2014
28. Automated Road Safety Analysis using Video Data Montreal Students' Chapter - Canadian Transportation Research Forum Conference, April 7th 2014
29. Automated Methods for Surrogate Safety Analysis, Webinar for the New York City Department of Transportation, February 24th 2014
30. Understanding Collision Processes using Video Data, TRB Workshop on Comparison of Surrogate Measures of Safety Extracted from Video Data, January 12th 2014
31. Automated Surrogate Road Safety Analysis, Concordia Institute for Information Systems Engineering (CIISE) Distinguished Seminar Series, November 14th 2013
32. Diagnostic de sécurité routière à l'aide de données vidéo, IFFSTAR-ENTPE Seminar, May 22nd 2013
33. Diagnostic de sécurité routière à l'aide de données vidéo, Institut Pascal Seminar, May 14th 2013
34. Analyse de la sécurité des carrefours giratoires au Québec, 48ème Congrès de l'AQTr, March 25th 2013

35. Member of the panel of the AQTr workshop "Les STI intégrés : enjeux et perspectives", February 7th 2013
36. 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
37. Open source tools for trajectory data analysis, ITS Canada Annual Conference, Québec, June 13th 2012
38. A Surrogate Safety Analysis at Protected Freeway Ramps Using Cross-Sectional and Before-After Video Data, ITS Canada Annual Conference, Québec, June 12th 2012
39. The Driverless Revolution, annual workshop of the research chair on mobility, Polytechnique Montréal, May 23rd 2012
40. Analyse proactive de la securite routiere et traitement d'image, annual workshop of the Network for Research in Road Safety, Laval University, May 22nd 2012
41. 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
42. Using Data Mining Techniques to Understand Collision Processes, Canadian Multidisciplinary Road Safety Conference, Halifax, Nova Scotia, May 9th 2011
43. Collecte de données sur les mouvements et la sécurité des piétons par caméra vidéo, 46ème Congrès de l'AQTr, April 12th 2011
44. ITS for Transportation Data Collection and Road Safety Analysis; Integrated Platform for Transportation Data Analysis, presentation of CIRRELT to Transport Canada, February 11th 2011
45. Investigating collision factors by mining microscopic data of vehicle conflicts and collisions, Transportation Research Board Annual Meeting, Washington, D.C., January 26th 2011
46. Member of the panel of the TRB workshop entitled "Place of Artificial Intelligence and Computation in the Complex World of Transportation", January 23rd 2011
47. Automated Road Safety Analysis using Video Sensors, TRAM & CIRRELT weekly transportation seminar, November 25th 2010
48. Automated Proactive Road Safety Analysis, University of Connecticut, November 1st, 2010
49. 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
50. Méthodes automatiques pour l'analyse proactive de la sécurité routière, 45ème Congrès de l'AQTr, March 30th 2010
51. 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
52. 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
53. A prototype system for truck signal priority using video sensors, 2009 Transportation Association of Canada Annual Meeting, Vancouver, October 19th 2009
54. Truck Signal Priority (with Wook Kang), 2009 ITE Quad Conference, Vancouver, May 2nd 2009
55. 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

56. Surrogate Safety Analysis, Surrogate Measures of Safety Subcommittee (ANB20(3)), Transportation Research Board Annual Meeting, Washington, D.C., January 13th 2009
57. Vision-Based Road Safety Analysis, 2008 Canadian Institute of Transportation Engineers (CITE) Annual Conference, Victoria, April 30th, 2008
58. Vision-based Road Safety Analysis, invited talk at the SFU Vision and Media Lab with professor Greg Mori, Vancouver, September 12th, 2007
59. Automated Road Safety Analysis Based on Video Sensors, Meeting with Christer Hydén and Åse Svensson, UBC, Vancouver, June 28th, 2007
60. Automated Road Safety Analysis Using Video Data, Translink, Vancouver, January 29th, 2007
61. Vehicle Trajectories Clustering with Dynamic Bayesian Networks for Traffic Safety Analysis, ITS Canada Annual Conference, Whistler, June 5th, 2006
62. Automated Road Safety Analysis Using Video Sensors, UBC Laboratory for Computational Intelligence Forum, Vancouver, April 24th, 2006
63. Clustering automatique de trajectoires avec des HMMs; Application à la sécurité du trafic routier, Séminaire Machine Learning ENST, Paris, January 9th, 2006
64. Automated Road Safety Analysis Using Video Sensors, UBC Transportation Seminar, Vancouver, September 15th, 2005
65. Stream-Based Learning through Data Selection in a Road Safety Application, STAIRS 2004, Valencia, June 24th, 2004
66. 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
67. Apprentissage incrémental par sélection de données dans un flux pour une application de sécurité routière, Conférence Cap 2004, Montpellier, June 14th, 2004
68. 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