Maria Laura Delle Monache

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Academic positions

Research scientist - CR   **Oct 2017 - Present**
Inria Grenoble - Rhône Alpes (France),
Team NeCS (Networked Controlled Systems)

Junior research scientist - CR2   **Oct 2016 - Sept 2017**
Inria Grenoble - Rhône Alpes (France)
Team NeCS (Networked Controlled Systems)

Post-Doctoral Fellow   **Nov 2014 - Aug 2016**
Rutgers University - Camden (USA)
Study and analysis of big data to understand traffic patterns. Optimal control of traffic networks. Modeling and simulation of traffic flow, Advisor: Prof. Benedetto Piccoli

Visiting scholar researcher   **Oct 2012 - Dec 2012 & May 2013**
UC Berkeley (USA)
Part of the optimal reroute strategies for traffic management team (Oreste). Optimal routing of flow on networks with continuous and discretized conservation laws and ramp metering using the adjoint method. Advisor: Prof. Alexandre M. Bayen

Education

PhD in Applied Mathematics   **Sept 2011 - Sept 2014**
Inria Sophia Antipolis - Méditerranée - University of Nice - Sophia Antipolis (France)
Grade: Trés honorable. Title: "Traffic flow modeling by conservation laws". Advisor: Dr. Paola Goatin

M.Sc. in Mathematical Modeling in Engineering   **Sept 2009 - Aug 2011**
University of L'Aquila (Italy), University of Hamburg (Germany)
Erasmus Mundus Consortium MathMods
Italian grade: 110/110 summa cum laude, German grade: 1.24 sehr gut

B. Sc. in Industrial Engineering   **Sept 2006 - Sept 2009**
University of L'Aquila (Italy)
Grade: 110/110 summa cum laude

Internships

Master Thesis internship   **Mar 2011 - Aug 2011**
University of Genoa (Italy)
Title: Mathematical modeling of the liver circulation. Advisors: Prof. Rodolfo Repetto and Prof. Ingenuin Gasser

Internship   **Mar 2010-Jul 2010**
Inria Sophia Antipolis - Méditerranée (France)
Title: Vehicular traffic flow modeling. Advisor: Dr. Paola Goatin

Computer Skills

Languages: Java, C++, Fortran, Ruby
Mathematical: Mathematica, Matlab, Maple, R, LaTeX
Web: HTML, CSS
Operating systems: Unix, Windows

Languages

Italian: Mother tongue
English: Level C1
French: Level B2
Spanish: Level A2

Scholarships, Awards and Honors

France - Berkeley Fund Award Recipient   **June 2017**
Collège de France

Research grant for young academics   **Oct 2010 - July 2011**
DAAD - German Academic Exchange Service

Erasmus grant   **Feb 2010 - Sept 2011**
University of L'Aquila

INFN Full Scholarship   **Jul 2006 - Aug 2006**
Abruzzo government and Gran Sasso National Laboratory - National Institute of Nuclear Physics

Research projects

Mathematical models for interacting dynamics on networks   **2019-2023**
Management Committee substitute member
COST Action no. 18232 - European Grant

Mean field game models for traffic application   **2019-2020**
Principal Investigator
Rutgers Global Grant - International collaborative research grant with the group of Prof. Benedetto Piccoli at Rutgers
University - Camden (USA)

MEMENTO   **2018-2020**
Principal Investigator
Inria associated team with the group of Prof. Dan Work at Vanderbilt University.
Website: `http://necs.inrialpes.fr/memento/index.html`

MAVIT - Modeling autonomous vehicles in traffic flow   **2018-2019**
Principal Investigator
IRS Accueil Nouveaux arrivant project

DATASAFE - Understanding data accidents for traffic safety   2018-2019
Principal Investigator
Grenoble Data Institute project

Scale-FreeBack   2016-2021
Member
ERC Advanced Grant. PI: Carlos Canudas-de-Wit

TramOpt   2017-2018
Member
ERC Proof of concept. PI: Paola Goatin

COMFORT - Control and forecasting in transportation networks   2016
Member
Inria associated team with UC Berkeley. PIs: Carlos Canudas-de-Wit and Roberto Horowitz

Control of vehicular traffic flow via low density autonomous vehicles   2015-2017
Member
NSF Award grant # 1837481. PI: Benedetto Piccoli

Ki-Net   2015-2016
Member
NSF Award grant # 1107444. Core Faculty: Benedetto Piccoli

TRAM 3 - Traffic management by macroscopic models   2011-2014
Member
ERC Starting grant. PI: Paola Goatin

ORESTE - Optimal reroute strategies for traffic management   2016-2021
Member
Inria associated team with UC Berkeley. PIs: Paola Goatin and Alexandre M. Bayen

Optimal Traffic Flow Management with GPS Enabled Smartphones   2012-2013
Member
France - Berkeley Fund. PIs: Paola Goatin and Alexandre M. Bayen

Organization of conferences

CPS-IoT week   18-21 May 2021
Workshop Co-Chair
Vanderbilt University, Nashville, USA

Lagrangian control for traffic smoothing in mixed autonomy settings   10 Dec 2019
Workshop organizer
Full day workshop at the 58th Conference on Decision and control, Nice, France

Traffic flow control via PDE Techniques   16 Dec 2018
Workshop organizer
Full day workshop at the 57th Conference on Decision and control, Miami Beach, FL, USA

Analysis and control of large scale complex networks   10-11 Sept 2018
Scientific committee
Scale-FreeBack workshop, Grenoble, France

Modélisation et gestion du trafic routier   **28 May-01 June 2018**
Mini-symposium organizer
44e Congrès National d'Analyse Numérique, Cap d'Agde, France

Modeling reduction tools for large scale complex networks   **21-22 Sept 2017**
Scientific committee
Scale-FreeBack workshop, Grenoble, France

Traffic modeling and management: trends and perspectives   **20-22 March 2013**
Local organizer
VI Workshop on Mathematical Foundations of Traffic, Sophia Antipolis, France

Service

Member of the Inria "Comité des études doctorales" for the admission of PhD students at the Grenoble - Rhône Alpes center.
Member of the Inria "Commission de développement technologique " (Technological development commission) for the examination of projects relating to the technological development and the application for the hiring of the engineers at Grenoble - Rhône Alpes center.

Referee activities

Associate Editor: European Control Conference (ECC)

Referee for: Automatica, SIAM Journal on Applied Mathematics, Journal of Differential Equations, IEEE Transactions for Intelligent Transportation Systems, Transportation Research: Part B and Part C, Journal of Intelligent Transportation Systems, IEEE Transactions on Automatic Control, IEEE Transaction on Vehicular Technology, IEEE Transactions on Control Systems Technology, Journal of Evolution Equations, Journal of Dynamic Systems, Measurement and Control, Mathematical Methods in the Applied Sciences, Networks and Heterogeneous Media, Physica A: Statistical Mechanics and its Applications, Physics Letters A, Journal of Mathematical Analysis and Applications, Journal of the Franklin Institute, IEEE Transaction on Control Network Systems, European Control Conference (ECC), IFAC Conference on Control for Transportation systems, Asian Journal of Control, American Control Conference (ACC), TRB Annual Meeting, IEEE Conference on Decision and Control (CDC), IEEE Intelligence Transportation Systems Conference (ITSC), IFAC World Congress, AMS Mathematical Reviews.

Supervision

Post-docs

Thibault Liard   **Dec 2017-Mar 2019**
Inria Grenoble - Rhône Alpes
Research topic: Modeling and control of mixed (human and driverless) traffic

PhD students

Liudmila Tumash   **Sept 2018-Present**
Inria Grenoble - Rhône Alpes, University of Grenoble
Research topic: Traffic control in large-scale urban networks. Co-supervised with C. Canudas-de-Wit

Stéphane Mollier   **Oct 2016-Feb 2020**

Inria Grenoble - Rhône Alpes, University of Grenoble

Research topic: Aggregated scale-free models for 2D large-scale traffic systems. Co-supervised with C. Canudas-de-Wit and B. Seibold

Master Students

Ali Salame   **Spring semester 2021**

University of Grenoble-Alpes

Research topic: Stability analysis and control of vehicle platoons with connected and autonomous vehicles. Co-supervised with P. Frasca and F. Garin

Xiaochen Li   **Spring semester 2021**

Inria Grenoble - Rhône Alpes

Research topic: The effect of COVID-19 on mobility. Co-supervised with P. Frasca

Mathilde de Jaureguiberry   **Fall semester 2020**

University of Grenoble-Alpes

Research topic: Mobility at the time of COVID-19. Co-supervised with P. Frasca

Cristina Magnetti-Gisolo   **Sept 2020-Feb 2021**

Inria Grenoble - Rhône Alpes

Research topic: Stability analysis of car-following models with mixed fleet. Co-supervised with P. Frasca and F. Ferrante

Dhannai Sepulveda   **Jan 2020-April 2020**

Inria Grenoble - Rhône Alpes

Research topic: Control for coupled PDE-ODE systems. Co-supervised with C. Prieur

Tianyi Wei   **Feb 2019-June 2019**

Inria Grenoble - Rhône Alpes, University of Grenoble

Research topic: Stabilizing traffic via autonomous vehicles. Co-supervised with P. Frasca

Aleksandra Malkova   **Feb 2018-July 2018**

Inria Grenoble - Rhône Alpes, University of Grenoble

Research topic: Understanding data accidents for traffic safety. Co-supervised with J. Arbel

Victor Bailly   **Summer 2016**

Visiting master student from University of Marseille at Rutgers University - Camden

Research topic: Modeling of roundabouts. Co-supervised with B. Piccoli

Mathieu Garcia   **Summer 2016**

Visiting master student from University of Marseille at Rutgers University - Camden

Research topic: Numerical simulations for roundabouts models. Co-supervised with B. Piccoli

Jiheng Huang   **Fall semester 2015**

New York University (NYU)

Research topic: Fundamental diagram from sensors around the world. Co-supervised with B. Piccoli and K. Ozbay

Undergraduate students

Kyra Jenkins <div style="float:right">**Spring semester 2016**</div>

Rutgers University - Camden

Research topic: Monday syndrome. Co-supervised with B. Piccoli

Millicent Kipp <div style="float:right">**Spring semester 2016**</div>

Rutgers University - Camden

Research topic: Fundamental diagrams around the world: the case study of Minneapolis. Co-supervised with B. Piccoli. Dean's undergraduate research prize

Hannah Pohlmann <div style="float:right">**Summer 2015**</div>

Temple University

Research topic: Simple control options for an AV for the dissipation of traffic waves on a circular and open road. Co-supervised with B. Piccoli and B. Seibold

Teaching

Traffic flow and crowd dynamics: modeling and computing <div style="float:right">**Spring semester 2018**</div>

University of Grenoble Alpes, Ecole doctorale MSTII

Lecturer for mathematics, computer science and engineering Master and PhD students, 18 hours

Linear Algebra <div style="float:right">**Fall semester 2015**</div>

Rutgers University - Camden

Lecturer for mathematics and computer science, 3 credits

Conferences, seminars and outreach

Outreach

La mobilité et les vehicules autonomes <div style="float:right">**May 2019**</div>

Université Grenoble Alpes, France

Cérémonie de remise de prix des Olympiades de Mathématiques, talk to students of 8th grade (4ème) and 11th Grade (1ère)

Seminars

Coupled PDE-ODE systems: applications to traffic flow modeling and control <div style="float:right">**Jan 2019**</div>

Laboratoire Jean Kuntzmann, Université Grenoble Alpes, France

PDE Seminar

Control of traffic: from ramp metering to autonomous vehicles <div style="float:right">**May 2018**</div>

Institute for Software Integrated Systems, Vanderbilt University, USA

Pizza Lecture

Control of traffic flow: from ramp metering to autonomous vehicles <div style="float:right">**Apr 2018**</div>

University of Alabama, USA

Seminar of the department of mathematics

Les mathématiques cachées du trafic routier   Mar 2018

Academie de Grenoble, Inria Grenoble - Rhône Alpes, France

ISN Conference, video

Coupled PDE-ODE systems: applications to traffic flow modeling and control   Nov 2017

Institute de Mathematiques de Marseille, France

Groupe de travail EDP hyperboliques, conditions limites et méthodes numériques

Ramp-metering and optimal rerouting traffic assignment   Dec 2016

UC Berkeley, USA

Traffic meeting

Some control strategies for conservation laws with applications to traffic flow   Nov 2016

Université de Toulon, France

Séminaire de théorie du côntrole de Toulon

Coupled PDE-ODE models: applications to traffic flow   Feb 2016

Temple University, Philadelphia, USA

Applied Mathematics and Scientific Computing Seminar

Crowd dynamics and vehicular traffic: mathematical modeling   Nov 2015

Center for Urban Science and Progress, New York University (NYU) New York, USA

CUSP "Research seminar series", with B. Piccoli

Macroscopic models for traffic flow   Oct 2013

IFSTTAR, Paris, France

IFSTTAR "Séminaire Modélisation des Réseaux de Transport"

Traffic flow modeling by conservation laws   Apr 2013

Universität Basel, Switzerland

Seminar Analysis

Continuous, Junction-based Model for Ramp Metering   Apr 2013

PATH (Partners for Advanced Transportation Technology), UC Berkeley, USA

Connected Corridors research seminar, with J. Reilly

Invited talks

Modeling for mixed autonomy traffic: a control-based approach   Nov 2020

Workshop on large scale autonomy: connectivity and mobility networks

IPAM (UCLA), USA

Coupled PDE-ODE systems: applications to traffic flow modeling, estimation   Sept 2020
and control

42nd workshop of research center for complex systems and network sciences

Southeastern University, China

Coupled PDE-ODE systems: applications to traffic flow modeling, estimation   Jan 2020
and control

Journée de l' équipe EMS

Université d'Orléans, France

Traffic modeling for mixed traffic   **Dec 2019**
Tutorial on "Autonomous vehicles and traffic control in mixed autonomy environment" at the Conference on Decision and Control
Nice, France

Overview of micro-macro models for mixed traffic   **Dec 2019**
Workshop "Lagrangian control for traffic control in mixed autonomy environment" at the Conference on Decision and Control
Nice, France

Traffic flow implications of autonomous and partially autonomous vehicles   **Sept 2019**
Workshop on "Connected and automated vehicles for energy efficient and environmental impact"
IFPEN, Rueil-Malmaison, France

Modeling autonomous vehicles in traffic flow   **July 2019**
International congress on Industrial and Appied Mathematics (ICIAM) 2019
Valencia, Spain

A decision support and planning mobility method for large scale traffic networks   **June 2019**
European Control Conference (ECC)
Naples, Italy

Micro - macro models for traffic with autonomous vehicles   **Feb 2019**
IPAM Workshop on Autonomous Vehicles
IPAM (UCLA), USA

Traffic control and estimation with autonomous vehicles   **Jan 2019**
Journée du groupe de travail en automatique et transports terrestres
Université Grenoble Alpes, France

Traffic reconstruction using autonomous vehicles   **Jan 2019**
Sixth Chilean Workshop on Numerical Analysis of PDEs (WONAPDE)
Concepciòn, Chile

Can big data help traffic control?   **Dec 2018**
Workshop on "Traffic control via PDE Techniques" at the Conference on Decision and Control
Miami Beach, USA

Control and estimation of traffic flow using autonomous vehicles   **Sept 2018**
Joint meeting of the Italian Mathematical Union, the Italian Society of Industrial and Applied Mathematics and the Polish Mathematical Society
Wroclaw, Poland

Micro-macro traffic modeling for estimation and control   **Sept 2018**
First SoPhy International Workshop on Societal-Scale Cyber-Physical Transport Systems Workshop
Stockholm, Sweden

Riemann solver for a macroscopic double-lane roundabout model   **June 2018**
15th IFAC Symposium on Control in Transportation Systems
Savona, Italy

Two-dimensional macroscopic model for large scale traffic network   **Apr 2018**
Incontro Scientifico su Modellizzazione ed Analisi di Problemi di Folle e Traffico
Politecnico di Torino, Italy

Control of traffic: from ramp metering to autonomous vehicles   Nov 2017
The finite volumes schemes and traffic modeling workshop

Besançon, France

Control of traffic via ramp metering and automated vehicles   June 2017
France-Berkeley Fund award ceremony

College de France, Paris, France

Traffic regulation via controlled speed limit   May 2017
SIAM Conference on Optimization

Vancouver, Canada

Traffic flow modeling   Nov 2016
Gipsa-Lab days

Grenoble, France

Traffic flow modeling and simulations with moving bottlenecks   July 2016
The 11th AIMS conference on dynamical systems, differential equations and applications

Orlando, USA

Modeling of traffic flow on networks   June 2016
BIS'2016 "Berkeley-Inria-Stanford Workshop 2016"

Inria Paris, France

Optimal control strategies for traffic flow   Jan 2016
Workshop TRAM3 Terminus

Inria Sophia Antipolis - Méditerranée, France

Traffic flow control via variable speed limit   Sept 2015
Mathematical foundations of traffic flow modeling (TRAWS1) Workshop

Institute of Pure and Applied Mathematics (IPAM), UCLA, USA

Towards smart transportation systems   Sept 2015
New Jersey Big Data Alliance 2015 Symposium. Panelist on "Big Data and Aviation/Transportation"

Rowan University, Glassboro, NJ, USA

A junction model for flow optimization on highway corridors   June 2014
CNAM, Paris, France

BIS'2014 "Berkeley-Inria-Stanford Workshop 2014"

A PDE-ODE model for a junction with ramp buffer   July 2013
Tenth meeting on Hyperbolic Conservation Laws: Recent results and Research perspectives

L'Aquila, Italy

A junction model for ramp metering   May 2013
BIS'2013 "Berkeley-Inria-Stanford Workshop 2013"

Stanford University, USA

Contributed talks

Big data and the fundamental diagram   Mar 2017
INDAM Workshop: Transport Modeling and Management

Rome, Italy

Traffic flow control: avoiding shocks via variable speed limit   **Mar 2015**
GAMM2015 "GAMM 86th Annual Scientific Conference"
Lecce, Italy

A conservative scheme for non-classical shocks arising in traffic flow modeling   **July 2014**
HYP2014 "15th International Conference on Hyperbolic Problems: Theory, Numerics, Applications"
Rio de Janeiro, Brazil

Traffic flow optimization on networks   **Sept 2013**
IperMib "15th Italian Meeting on Hyperbolic Equations"
Milan, Italy

Traffic flow optimization on roundabouts   **Sept 2013**
EWGT2013 "16th Euro Working Group on Transportation"
Porto, Portugal

A PDE-ODE model for a junction with ramp buffer   **Mar 2013**
TRAM2 "VI Workshop on Mathematical Foundations of Traffic (WMFT)"
Sophia Antipolis, France

Loi de conservation scalaire avec une contrainte mobile   **Feb 2013**
RIDA^{2}D 2013 "Rencontres Interdiciplinaires Doctorales de l'Architecture et de l'Aménagement Durables"
Lyon, France

Scalar conservation laws with moving density constraints arising in traffic flow **June 2012**
modeling
HYP2012 "14th International Conference on Hyperbolic Problems: Theory, Numerics, Applications"
Padova, Italy

Posters

Scalar conservation laws with moving density constraints arising in traffic flow **May 2013**
modeling
Congrès SMAI 2013 "6e Biennale Française des Mathématiques Appliquées et Industrielles"
Seignosse, France

Publications

Preprints

[1] A. Hayat, X. Gong, J. Lee, S. Truong, S. McQuade, N. Kardous, A. Keimer, Y. You, S. Albeaik, E. Vinistky, P. Arnold, M. L. Delle Monache, A. Bayen, B. Seibold, J. Sprinkle, D. B. Work, and B. Piccoli. A holistic approach to the energy-efficient smoothing of traffic via autonomous vehicles. Preprint.

[2] T. Liard, R. E. Stern, and M. L. Delle Monache. A PDE-ODE model for traffic control with autonomous vehicles. Preprint. URL: https://hal.archives-ouvertes.fr/hal-02492796/document.

[3] L. Tumash, C. Canudas-de Wit, and M. L. Delle Monache. Boundary and vsl control for large-scale urban traffic newtorks. Preprint.

[4] L. Tumash, C. Canudas-de Wit, and M. L. Delle Monache. Boundary control design for traffic with non-linear dynamics. Preprint. URL: https://hal.archives-ouvertes.fr/hal-02955853/document.

[5] Y. Wang, M. L. Delle Monache, and D. B. Work. Identifiability of car-following dynamics. Preprint.

Journal papers

[6] M. L. Delle Monache, K. Chi, Y. Chen, P. Goatin, K. Han, J.-M. Qiu, and B. Piccoli. A three-phase fundamental diagram from three-dimensional traffic data. *Axioms*, 10(1), 2021. Available from: https://hal.inria.fr/hal-01864628/document.

[7] Y. Wang, G. Gunter, M. Nice, M. L. Delle Monache, and D. B. Work. Online parameter estimation methods for adaptive cruise control systems. *IEEE Transactions on Intelligent Vehicles*, 2020, to appear. Available from: https://hal.inria.fr/hal-03011790/document.

[8] G. Gunter, D. Gloudemans, R. E. Stern, S. McQuade, R. Bhadani, M. Bunting, M. L. Delle Monache, R. Lysecky, B. Seibold, J. Sprinkle, B. Piccoli, and D. B. Work. Are commercially implemented adaptive cruise control systems string stable? *IEEE Transactions on Intelligent Transportation Systems*, 2020, to appear. Available from: https://arxiv.org/pdf/1905.02108.pdf.

[9] V. Giammarino, S. Baldi, P. Frasca, and M. L. Delle Monache. Traffic flow on a ring with a single autonomous vehicle: an interconnected stability perspective. *IEEE Transactions on Intelligent Transportation Systems*, 2020, to appear. Available from: https://hal.inria.fr/hal-03011895/document.

[10] F. Wu, R. Stern, S. Cui, M. L. Delle Monache, R. Badhani, M. Bunting, M. Churchill, N. Hamilton, R. Haulcy, B. Piccoli, B. Seibold, J. Sprinkle, and D. B. Work. Tracking vehicle trajectories and fuel rates in oscillatory traffic. *Transportation Research Part C: Emerging Technologies*, 99:82–109, 2019. Available from: https://hal.inria.fr/hal-01614665.

[11] R. Stern, Y. Chen, M. Churchill, F. Wu, M. L. Delle Monache, B. Piccoli, B. Seibold, J. Sprinkle, and D. B. Work. Quantifying air quality benefits resulting from few autonomous vehicles stabilizing traffic. *Transportation Research Part D: Transport and Environment*, 67:351–365, 2019. Available from: https://hal.inria.fr/hal-02022692.

[12] S. Mollier, M. L. Delle Monache, C. Canudas-de-Wit, and B. Seibold. Two-dimensional macroscopic model for large scale traffic networks. *Transportation Research Part B: Methodological*, 122:309–326, 2019. Available from: https://hal.inria.fr/hal-01819013v1.

[13] M. L. Delle Monache, T. Liard, B. Piccoli, R. Stern, and D. B. Work. Traffic reconstruction using autonomous vehicles. *SIAM Journal on Applied Mathematics*, 79(5):1748–1767, 2019. Available from: https://hal.inria.fr/hal-01882309.

[14] R. E. Stern, S. Cui, M. L. Delle Monache, R. Bhadani, M. Bunting, M. Churchill, N. Hamilton, H. Pohlmann, F. Wu, B. Piccoli, et al. Dissipation of stop-and-go waves via control of autonomous vehicles: Field experiments. *Transportation Research Part C: Emerging Technologies*, 89:205–221, 2018. Available from: https://arxiv.org/pdf/1705.01693.pdf.

[15] S. Samaranayake, W. Krichene, J. Reilly, M. L. Delle Monache, P. Goatin, and A. Bayen. Discrete-time system optimal dynamic traffic assignment (SO-DTA) with partial control for physical queuing networks. *Transportation Science*, 52(4):982–1001, 2018. Available from: https://hal.inria.fr/hal-01095707.

[16] S. Mollier, M. L. Delle Monache, and C. Canudas-de-Wit. A simple example of two dimensional model for traffic: discussion about assumptions and numerical methods. *Transportation Research Record: Journal of the Transportation Research Board*, 2672(20):249–261, 2018. Available from: https://hal.archives-ouvertes.fr/hal-01665285.

[17] M. L. Delle Monache, B. Piccoli, and F. Rossi. Traffic regulation via controlled speed limit. *SIAM Journal on Control and Optimization*, 55(5):2936–2958, 2017. Available from: https://arxiv.org/pdf/1603.04785v1.pdf.

[18] M. L. Delle Monache, P. Goatin, and B. Piccoli. Priority-based Riemann solver for traffic flow on networks. *Communications in Mathematical Sciences*, 16(1):185–211, 2017. Available from: https://hal.inria.fr/hal-01336823/document.

[19] M. L. Delle Monache and P. Goatin. Stability estimates for scalar conservation laws with moving flux constraints. *Networks and Heterogeneous Media*, 12(2):245–258, 2017. Available from: https://hal.inria.fr/hal-01380368/document.

[20] C. Chalons, M. L. Delle Monache, and P. Goatin. A conservative scheme for non-classical solutions to a strongly coupled PDE-ODE problem. *Interfaces and Free Boundaries*, 19(4):553–570, 2017. Available from: https://hal.inria.fr/hal-01070262.

[21] S. Blandin, X. Litrico, M. L. Delle Monache, B. Piccoli, and A. Bayen. Regularity and Lyapunov stabilization of weak entropy solutions to scalar conservation laws. *IEEE Transactions on Automatic Control*, 62(4):1620–1635, 2017. Available from: https://hal.inria.fr/hal-01267722/document.

[22] J. Reilly, S. Samaranayake, M. L. Delle Monache, W. Krichene, P. Goatin, and A. M. Bayen. Adjoint-based optimization on a network of discretized scalar conservation laws with applications to coordinated ramp metering. *Journal of optimization theory and applications*, 167(2):733–760, 2015. Available from: https://hal.inria.fr/hal-00878469.

[23] L. L. Obsu, M. L. Delle Monache, P. Goatin, and S. M. Kassa. Traffic flow optimization on roundabouts. *Mathematical Methods in the Applied Sciences*, 38(14):3075–3096, 2015. Available from: https://hal.inria.fr/hal-00939985.

[24] M. L. Delle Monache, J. Reilly, S. Samaranayake, W. Krichene, P. Goatin, and A. M. Bayen. A PDE-ODE model for a junction with ramp buffer. *SIAM Journal on Applied Mathematics*, 74(1):22–39, 2014. Available from: https://hal.inria.fr/hal-00786002.

[25] M. L. Delle Monache and P. Goatin. Scalar conservation laws with moving constraints arising in traffic flow modeling: an existence result. *Journal of Differential equations*, 257(11):4015–4029, 2014. Available from: https://hal.inria.fr/hal-00976855.

[26] M. L. Delle Monache and P. Goatin. A front tracking method for a strongly coupled PDE-ODE system with moving density constraints in traffic flow. *Discrete and Continuous Dynamical Systems-Series S*, 7(3):435–447, 2014. Available from: https://hal.inria.fr/hal-00930031.

Book chapters

[27] M. L. Delle Monache, T. Liard, A. Rat, R. Stern, R. Badhani, B. Seibold, J. Sprinkle, D. B. Work, and B. Piccoli. Feedback control algorithms for the dissipation of traffic waves with autonomous vehicles. In *Computational Intelligence and Optimization Methods for Control Engineering*, chapter 12, pages 275–299. Springer, 2019. Available from: https://hal.inria.fr/hal-02335658.

[28] S. Čanić, M. L. Delle Monache, B. Piccoli, J.-M. Qiu, and J. Tambača. Numerical methods for hyperbolic nets and networks. In *Handbook of Numerical Analysis*, volume 18, pages 435–463. Elsevier, 2017.

Conference proceedings

[29] L. Tumash, C. Canudas-de Wit, and M. L. Delle Monache. Equilibrium manifold in 2D fluid traffic models. In *Proceedings of the IFAC World Congress, 2020, Berlin, Germany*, to apppear. https://hal.archives-ouvertes.fr/hal-02513273v2/document.

[30] T. Liard, R. E. Stern, and M. L. Delle Monache. Optimal driving strategies for traffic control with autonomous vehicles. In *Proceedings of the IFAC World Congress, 2020, Berlin, Germany*, to appear. Available from: https://hal.archives-ouvertes.fr/hal-02498038/document.

[31] L. Tumash, C. Canudas-de Wit, and M. L. Delle Monache. Topology-based control design for congested areas in urban network. In *Proceedings of the International Conference on Intelligent Transportation Systems, 2020, Rhodes, Greece.*, pages 1–6, 2020. Available from: `https://hal.archives-ouvertes.fr/hal-02860455v1/document`.

[32] L. Tumash, C. Canudas-de-Wit, and M. L. Delle Monache. Robust tracking control design for fluid traffic dynamics. In *IEEE Conference on Decision and Control (CDC), Nice, France*, pages 4085–4090, 2019. Available from: `https://hal.archives-ouvertes.fr/hal-02331493/`.

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