

Elisa Iacomini

PERSONAL DATA

ADDRESS: Via Machiavelli 30, 44121 Ferrara (FE), Italy
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RESEARCH TOPICS: Conservation laws
Numerical methods for hyperbolic problems
Traffic flow modeling
Wasserstein distance
Optimal transport problem
Uncertainty quantification
Inverse problems

ACADEMIC POSITION

Jan 2023 - Present **Associated Researcher (RTdA) at University of Ferrara**
Department of Mathematics and Data Science, Ferrara,
RESEARCH GROUP OF: Prof. Lorenzo Pareschi.

July 2020 - Dec 2022 **PostDoc at RWTH Aachen**
Institut für Geometrie und Praktische Mathematik, Aachen,
RESEARCH GROUP OF: Prof. Michael Herty.

Jan 2020 - Jun 2020 **PostDoc at University of Mannheim**
School of Business Informatics and Mathematics, Mannheim,
RESEARCH GROUP OF: Prof. Simone Göttlich

EDUCATION

FEBRUARY 2020 **PhD in Mathematical Modeling for Engineering, Electromagnetism and Nanoscience**
THESIS TITLE: Mathematical Models and Methods for Traffic Flow and Stop & Go waves
SUPERVISORS: Prof. Fabio Camilli, Dr. Emiliano Cristiani
Dipartimento di Scienze di Base e Applicate per l'Ingegneria (SBAI), Sapienza University of Rome.

JULY 2016 **Master Degree in Applied Mathematics**
FINAL MARK: 110/110 cum laude
THESIS TITLE: Un approccio numerico alla quantificazione dell'incertezza per modelli di traffico veicolare su grandi reti
SUPERVISORS: Prof. Maurizio Falcone, Dr. Emiliano Cristiani
Dipartimento di Matematica, Sapienza University of Rome.

OCTOBER 2013 **Bachelor Degree in Mathematics**
FINAL MARK: 108/110
THESIS TITLE: Alcuni metodi di ottimizzazione per problemi multiobiettivo
SUPERVISOR: Prof. Maurizio Falcone
Dipartimento di Matematica, Sapienza University of Rome.

PUBLICATIONS

Published

- [15] E. Iacomini,
Overview on uncertainty quantification in traffic models via intrusive method,
SEMA SIMAI Springer Series, 2023.
- [14] M. Herty, E. Iacomini,
Filtering methods for coupled inverse problems,
SIAM Journal on Applied Dynamical Systems (SIADS), 2023.
- [13] B. Mohamed, et al.
Actionable Artificial Intelligence for the Future of Production,
Internet of Production: Fundamentals, Applications and Proceedings Springer, 2023.
- [12] N. Guglielmi, E. Iacomini, A. Viguerie,
Identification of Time Delays in COVID-19 Data,
Epidemiologic Methods, 2023.
- [11] M. Rom, M. Brockmann, M. Herty, E. Iacomini
Machine learning tools in production engineering,
The International Journal of Advanced Manufacturing Technology, 2022.
- [10] M. Herty, E. Iacomini, G. Visconti
Recent trends on nonlinear filtering for inverse problems,
Communications in Applied and Industrial Mathematics, 2022.
- [9] M. Herty, E. Iacomini,
Uncertainty quantification in hierarchical vehicular flow models,
Kinetic and Related Models, 2022.
- [8] N. Guglielmi, E. Iacomini, A. Viguerie,
Delay differential equations for the spatially resolved simulation of epidemics with specific application to COVID-19,
Mathematical Methods in the Applied Sciences, 2021.
- [7] S. Gerster, M. Herty, E. Iacomini,
Stability analysis of a hyperbolic stochastic Galerkin formulation for the Aw-Rasclé-Zhang model with relaxation,
Mathematical biosciences and engineering, 2021.
- [6] S. Göttlich, E. Iacomini, T. Jung,
Properties of the LWR model with time delay,
Network & Heterogeneous Media, 2021.
- [5] E. Iacomini, P. Vellucci,
Contrarian effect in opinion forming: insights from Greta Thunberg phenomenon,
The Journal of Mathematical Sociology, 2021.
- [4] C. Balzotti, E. Iacomini,
Stop & Go waves: a microscopic and a macroscopic description,
Mathematical descriptions of traffic flow: micro, macro and kinetic models,
SEMA SIMAI Springer Series, 2020.

- [3] E. Cristiani, E. Iacomini,
An interface-free multi-scale multi-order model for traffic flow,
Discrete and Continuous Dynamical Systems - Series B, 2019.

- [2] F. Camilli, R. De Maio, E. Iacomini,
A Hopf-Lax formula for Hamilton-Jacobi equations with Caputo time derivative,
Journal of Mathematical Analysis and Applications, 2019.

- [1] M. Briani, E. Cristiani, E. Iacomini,
*Sensitivity analysis of the LWR model for traffic forecast on large networks
using Wasserstein distance*,
Communications in Mathematical Sciences, 2018.

SCIENTIFIC COMMUNICATIONS (SELECTED)

- Sept 12, 2023 TALK AT HIRSCHEGG23
Workshop on Conservation Laws.
Hirschegg (Austria).
- Aug 22, 2023 TALK AT ICIAM23
Minisymposium on Interfaces between kinetic equations and many-agent social systems.
Tokyo (Japan).
- Mar 03, 2023 TALK AT SIAMCSE23
Minisymposium on Uncertainty Quantification for Physical Flow Networks.
Amsterdam (Netherlands).
- Jul 3-9, 2022 ECMI MW 22
Instructor at the ECMI Modelling Week
University of Verona.
- Jun 24, 2022 TALK AT HYP22
Topic: Numerical methods. Uncertainty quantification
Malaga (Spain).
- Apr 15, 2022 CONTRIBUTED TALK AT SIAMUQ22
Topic: Application of UQ
Atlanta (US).
- Dec 17, 2021 INVITED SPEAKER AT NUMASP YRM
Verona.
- Sept 2, 2021 MINISYMPOSIUM'S TALK AT SIMAI21
Minisymposium on Optimal control, differential games and applications,
Parma.
- Aug 19, 2021 MINISYMPOSIUM'S TALK AT MCM21
Minisymposium on UQ for hyperbolic partial differential equations,
Mannheim (Germany).
- Feb 7, 2020 CONTRIBUTED TALK AT GNCS19
Approssimazione numerica di problemi di natura iperbolica ed applicazioni
La Sapienza University of Rome.
- Nov 28, 2019 POSTER SESSION AT RICAMW5
RICAM Workshop on Feedback Control
Johann Radon Institute for Computational and Applied Mathematics,
Linz (Austria).
- Sept 4, 2019 MINISYMPOSIUM'S TALK AT UMI19
Minisymposium on Models and Applications,
Pavia.
- Jul 18, 2019 MINISYMPOSIUM'S TALK AT ICIAM19
Minisymposium on Mathematical descriptions of traffic flow: micro, macro and kinetic models
International Congress on Industrial and Applied Mathematics (ICIAM) - Valencia (Spain).
- Nov 20, 2018 KWIM: WOMEN IN MATHEMATICS
University of Konstanz.

TEACHING

- ST 2024 **Foundations of Data Science**
University of Ferrara.
- ST 2024 **Numerical Analysis II**
University of Ferrara.
- WT 2023 **Numerical Optimization**
University of Ferrara.
- WT 2022 **Tutor of Continuous Optimization (in English)**
RWTH Aachen University.
- July 2022 **Instructor at the ECMI Modelling Week**
University of Verona.
- ST 2022 **Seminar Nonlinear Optimization (in English)**
RWTH Aachen University.
- FEB 2022 **Introduction to hyperbolic conservation laws and applications**
PhD course, SBAI Department, Sapienza, Università di Roma.
- ST 2021 **Tutor of Nonlinear Optimization (in English)**
RWTH Aachen University.
- ST 2020 **Numerik Partieller Differentialgleichungen (8 ECTS, in English)**
Master Wirtschaftsmathematik, University of Mannheim.
- WT 2019 **Tutor of Analisi I (SSD MAT/05)**
Ingegneria Chimica, Sapienza Università di Roma.
Teacher: Prof. T. Leonori.
- WT 2018 **Tutor of Analisi I (SSD MAT/05)**
Ingegneria delle Comunicazioni ed Elettronica, Sapienza Università di Roma.
Teacher: Prof. D. Sforza.
- ST 2019 **Tutor of Matematica corso base**
Economia, Sapienza Università di Roma, sede Latina.
Teacher: Prof. G. Rotundo.
- WT 2018 **Tutor of Analisi I (SSD MAT/05)**
Ingegneria Chimica, Sapienza Università di Roma.
Teacher: Prof. T. Leonori.
- WT 2018 **Preliminar course of Mathematics**
Ingegneria ICI, Sapienza Università di Roma.

WT 2017 **Tutor of Analisi I (SSD MAT/05)**
Ingegneria Chimica, Sapienza Università di Roma.
Teacher: Prof. T. Leonori.

WT 2017 **Tutor of Analisi I (SSD MAT/05)**
Ingegneria Informatica, Sapienza Università di Roma.
Teacher: Prof. F. Camilli.

FUNDINGS

2023 - 2025 FIRD
Opinion dynamics and Machine Learning
Principal Investigator: Dr. Elisa Iacomini
Total Funded: 4,623.00 €

PROJECTS

2023 GNCS-INDAM
Metodi numerici per problemi differenziali multiscala: schemi di alto ordine, ottimizzazione, controllo
Principal Investigator: Dr. Giulia Bertaglia
Total Funded: 2,500.00 €

2021 - pres FACEBOOK URLS DATASET
Democracy in the age of data: a Facebook study
Principal Investigator: Prof. Fabio Camilli

2020 - 2023. IoP - CLUSTER OF EXCELLENCE "INTERNET OF PRODUCTION"

2019 GNCS-INDAM
Numerical approximation of hyperbolic problems and applications
Principal Investigator: Dr. Elisabetta Carlini
Total Funded: 6,400.00 €

2018-2020 COLLABORATION WITH AUTOVIE VENETE
traffic forecast from fixed and mobile sensors.

2018-2021 PRIN 2017
Innovative Numerical Methods for Evolutionary Partial Differential Equations and Applications
Principal Investigator: Prof. Giovanni Russo
Total Funded: 438,000.00 €

EXPERIENCES AND AWARDS

- 2017-pres. MEMBER OF GNCS
Gruppo Nazionale Calcolo Scientifico GNCS-INdAM.
- 2018-2020 COLLABORATION WITH AUTOVIE VENETE
Traffic forecast from fixed and mobile sensors.
- Oct - Nov, 2018 VISITING PHD STUDENT AT MANNHEIM UNIVERSITY
Funded by the Federal Ministry of Education and Research (IPID4all Project)
Supervisor: Prof. Simone Göttlich.
- 2018-2019 GRANT FOR YOUNG RESEARCHER BY LA SAPIENZA
Project:*PREVENT: accurate PREDictions for VEhicular Traffic on Networks in urban society.*
- 2017-2019 AFFILIATION AT CNR-IAC
Supervisor: Dott. Emiliano Cristiani

LANGUAGES

ENGLISH: Fluent
GERMAN: A2
FRENCH: Basic Knowledge (A1)

COMPUTER SKILLS

PROGRAMMING LANGUAGE: C++, Matlab, FreeFEM.
OTHER KNOWLEDGE: L^AT_EX, PowerPoint, Excel, Word, Paraview.

OTHERS

REVIEWER FOR: SIADS, Physica A, NHM, Mathematics and Computers in Simulation (Elsevier),
Zeitschrift für angewandte Mathematik un Physik, JCP.