Personal information

Surname(s) / First name(s) **PhD. Festa, Adriano**

Email(s) adrianofesta@gmail.com, adriano.festa@insa-rouen.fr

Web http://www.adrianofesta.altervista.org

Research themes

Analysis and **Numerics** of PDE, **High Performances** Computing.
Optimal control, Multi-agents systems, **Mean-field** models,

Working Experiences

01/11/2018 -	**RTDa** (Researcher with didactic charge), Università dell'Aquila, Italia
01/12/2016 - 30/10/2018	**Post-Doc** Researcher, INSA, LMI, Rouen, France
01/12/2014 - 30/11/2016	**Post-Doc** Researcher, RICAM, Austrian Academy of Science, Linz, Austria
15/11/2013 - 15/11/2014	**Post-Doc** Researcher, ENSTA ParisTech, Paris, France
19/03/2012 - 18/09/2013	**Experienced** Researcher, Imperial College London, EEE Department, UK.
01/09/2008 - 01/02/2009	**Computer programmer**, stage. Infobyte s.p.a., Digital products for Broadcasting, http://www.infobyte.it

Visiting periods

2018	**PUC**-Ponteficia Universitade Catolica de Rio, Rio de Janeiro, Brazil. (collaboration with A. Alla)
19/01 - 3/02 2018	**Imperial College** London. (collaborazione con D. Kalise)
15/09 2017 - 15/12/2017	**SCICOM**, University of Mannheim, Germany. (collaboration with S. Göttlich and M. Pfirsching)
17-25/02 2017	**KAUST**, Jeddah, Saudi Arabia (collaboration with D. Gomes and R. Velho)
13-19/03 and 19-23/09 2016	**Politecnico Turin**, Italy (collaboration with A. Tosin)
01/06/2015 - 30/06/2015	**Sapienza University** of Rome, Italy (collaboration with F. Camilli and M. Falcone)
02/03/2013 - 18/09/2013	**CMAP**, École Polytechnique, Paris, France (Collaboration with J.F. Bonnans)

Research projects

2018	**MOR – MFG project**, (Principal investigator), 'Model Order Reduction for Mean-Field Games'
2016-2018	**M2NUM project**, (Research associate), Haute-Normandie Regional Council, Modélisation Mathématique: applications et simulations NUMériques pour les énergies renouvelables, l'éco-mobilité, l'imagerie et la physique.
2018	**BOUM project**, (Principal investigator), 'Modèles de trafic multi-populations et dispositifs de prévision du trafic'
2014-2016	**New Frontiers program** Austrian Academy of Sciences (OeAW) NST-001, (Research associate), Multi-scale modeling and simulation of crowded transport in the life and social sciences
2012-2014	**ITN Marie Curie Actions** FP7-PEOPLE-2010-ITN SADCO, (MC-Research Fellow) Sensitivity Analysis for Deterministic Controller Design SADCO

Teaching experiences

02 - 07/2018	**InterMaths, International Master Program**, *Parallel Computing* Master Class for the University of L'Aquila (60h), Italy
01 - 2019	**PhD Course**, *Optimal control and Hyperbolic PDE* for the doctoral school of L'Aquila University (10h), Italy
09 - 12/2018	**Applied Mathematics chair, (Visiting lecturer)**, *Strategy and Games in Continuous Systems* for the master and doctoral school of the University of Mannheim (45h), Germany
01/09 - 30/12 2017	**Numerical Analysis chair, (Visiting lecturer)**, *Numerical methods for Hamilton Jacobi equations* for the master and doctoral school of the University of Mannheim (50h), Germany
15/01 - 30/06 2017	**TD, (Tutor)** *Algèbre Linéaire* for the 1st year of degree in Engeneering (39h), INSA, Rouen
06/01 - 30/03 2014	**TD, (Tutor)** *Optimisation Quadratique* for the 1st year of degree in Engeneering (30h), ENSTA, Palaiseau
01/2013	*Introduction to Differential Games* **mini-course** for PhD students and Post-docs, Young Researchers Workshop on System Dynamics and Optimal Control SADCO, Funchal, Portugal
01/10 - 20/12/2012	**Tutor** *Mathematics 2* for the second year of degree in Engineering (40h), ICL, London
a.y. 2009-2010	**Tutor** *Numerical Methods for PDE* (Master 15h), Math. Dep. Sapienza University Rome, Italy
a.y. 2009-2010	**Tutor** *Computer Science and Programming* (C++, 50h), Math. Dep. Sapienza Università di Roma, Italy

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a.y. 2008-2009 | **Tutor** *Numerical Analysis and programming* (1st 50h) Math. Dep. Sapienza Università di Roma, Italy

Education

January 2012 | **Philosophiae Doctor** in *Mathematics*, Sapienza Università di Roma, Italy
Thesis: *Analysis and approximation of Hamilton-Jacobi equations with irregular data*
Keywords | Viscosity solutions, Semilagrangian schemes, Error estimates, PDE on networks, Image processing.
Committee | Profs. *M. Falcone (Supervisor)*, Antonio Siconolfi (President), Giovanni Russo, Hasnaa Zidani.

February 2009 | **Training course** in *Innovative methods for Graphics, Image processing and Multimedia and Geographical data*, Italia Lavoro, Programma FIXO - Azione 3
Keywords | Image Processing, High Performances Programming, Data management.

January 2008 | **Master degree** in *Mathematics for Applications*, 110/110 cum Laude, Sapienza Università di Roma
Thesis: *Recent progresses on the Optical Flow problem.* Supervisor: *Prof. M. Falcone*

September 2005 | **Bachelor degree** in *Mathematics*, 110/110 cum Laude, Sapienza Università di Roma, Italy
Thesis: *Viscosity solutions and the SFS Problem.* Supervisor: *Prof. A. Siconolfi*

Grants/awards

2018 | **MOR – MFG project**, (Principal investigator), 'Model Order Reduction for Mean-Field Games' funded by Brazilian-French Network in Mathematics ($\sim$ 2.5k Eur)
2017 | **BOUM grant** obtained through a competitive call as P.I. of the project 'Modèles de trafic multi-populations et dispositifs de prévision du trafic' co-funded by SMAI and INSA (2k Eur)
2014 | **Financial support** to attain HYP14 (Rio, Brasil) funded by IMPA (1k Eur)
2012-2013 | Post Doc Fellowship **ITN Marie Curie Actions**, Sensitivity Analysis for Deterministic Controller Design SADCO, http://itn-sadco.inria.fr/
2009-2011 | Doctoral Scholarship at Sapienza Università di Roma, Italy
2002 | Best new students award in Mathematics, Sapienza Università di Roma

Responsabilities

Reviewer for IEEE Trans. Control Syst. Technol., IEEE-CDC Proceedings, DCDS-A, Automatica, Math. Comput. Model. Dyn. Syst., ZbMath, MathSciNet, SINUM, Appl. Math. Opt., Rev. Cont. Letters, Num. Math.

2019 | **Organizer** of the special session "Mean Field Games and Application" at the ICIAM 2019 Valencia with F. Silva and D. Tonon.
2019 | **Organizer** of the ASCANA (l'Aquila Seminars in Control, Automation and Numerical Analysis) with M. Palladino and G. Pola.
28-29/03/2019 | **Organizer** of the 2 days workshop "Control theory and Applications" at GSSI L'Aquila with M. Palladino, A. Marigonda and R. Guglielmi.
5-9/10/2019 | **Organizer** of the 5 days autumn school + workshop "Rencontres Normandes sur les aspects theoriques et numeriques des EDP" at INSA Rouen with L. Baffico, G. Croce, N. Forcadel, O. Guibé, F. Luddens, A. Tonnoir.
2018 | **Organizer** of the the special session "Modeling and optimization of networked systems" at the IFIP-2018 Essen with S. Goettlich and S. Knapp.
2018 | **Organizer** of the the special session "Mean Field Games: from theory to applications" at the AIMS-2018 Taipei with D. Tonon and F. Silva.
2017 | **Organizer** of the mini-symposium "Numerical Approximation and Optimization of Agent-based Models" at the 27th Biennial Numerical Analysis Conference in Glasgow, June 2017 with D. Kalise.
2016 | **Organizer** of the special session "Recent developments of Mean Field Games and applications" at AIMS-2016 Orlando with D. Tonon.
2014 - 2016 | **Organizer** of Radon Group Seminars http://www.ricam.oeaw.ac.at/events/
2013 - 2014 | **Organizer** of the Seminars for the GdT COMMANDS, http://commands.saclay.inria.fr/seminar
2011 - 2012 | **Organizer** of the Seminars "Modellistica Differenziale Numerica", Rome, http://www1.mat.uniroma1.it/ricerca/seminari/mdn/
2015 - 2016 | Associated **Editor** of "Optimal Control: Novel Directions and Applications" for Lectures Notes, Springer 2017.

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List of Publications

AF, R. Ferretti — **18.** *Optimal route planning for sailing boats: a hybrid formulation.* (online first) J. Optim. Theory and Appl. (2019).

AF, M. Pfirsching, S. Göttich — **17.** *A model for a network of conveyor belts with various speed and capacity.* Net. Het. Med. 14(2), 389–410, (2019).

AF, S. Göttich — **16.** *A Mean Field Games approach for multi-lane traffic management.* IFAC-PapersOnLine 51(32), pp. 793-798, (2018).

AF, D. Gomes, R. Velho. — **15.** *An Adjoint-based Numerical Method for a class of nonlinear Fokker-Planck Equations.* in PDE Models for Multi-Agent Phenomena, Ed. P. Cardaliaguet, A. Porretta, F. Salvarani pp. 73–92 (2018).

AF — **14.** *A domain decomposition based parallel version of the Howard's Algorithm*, Math. Comput. Simul. 147, 121–139 (2018).

AF, A. Tosin, MT. Wolfram — **13.** *Kinetic description of collision avoidance in pedestrian crowds by sidestepping.* Kin. Relat. Mod. 11(3) 491–520, (2018).

F. Bonnans, AF — **12.** *Error estimates for the Euler discretization of an optimal control problem with a first-order state constraint.* SIAM J. Numer. Anal., 55(2) 445–471, (2018).

E. Carlini, AF, F. Silva — **11.** *The Hughes model for pedestrian dynamics and congestion modelling*, IFAC-PapersOnLine. 50 (1), 1655–1660 (2017).

AF, A. Picarelli, C. Hermosilla, F. Silva, R. Guglielmi — **10.** *Hamilton–Jacobi–Bellman equations.* "Optimal Control Design: Novel Directions and Applications", M. S. Aronna, D. Kalise, D. Tonon Eds., (124 pp.) Lectures notes, Springer, 2017.

F. Camilli, AF, S. Tozza — **9.** *A discrete Hughes' model for pedestrian flow on graphs.* Net. Het. Med. 12(1) 93-112 (2017).

E. Carlini, AF, F. Silva, MT. Wolfram — **8.** *Semi-Lagrangian scheme for a modified version of the Hughes model for pedestrian flow.* Dyn. Games Appl., 1–23, (2016).

AF — **7.** *Reconstruction of Independent Sub-Domains for a class of Hamilton Jacobi Equations and its Application to Parallel Computing*, ESAIM:M2AN 50(4), 1223–1240, (2016).

AF, R. Vinter — **6.** *Decomposition of Differential Games with Multiple Targets*, J. Optim. Theory Appl. 169(3), 848-875 (2016).

AF, MT. Wolfram — **5.** *Collision avoidance in pedestrian dynamics*, Proceedings of 54nd IEEE Control and Decision Conference (CDC), 3187–3192, (2015).

AF, M. Falcone — **4.** *An approximation scheme for an Eikonal Equation with discontinuous coefficient*, SIAM J. Num. Anal., 52(1) 236–257 (2014).

F. Camilli, AF, D. Schieborn — **3.** *Shortest paths and Eikonal equations on a graph.* Appl. Numer. Math. 73 33–47 (2013).

AF, R. Vinter — **2.** *A decomposition technique for pursuit evasion games with many pursuers*, Proceedings of 52nd IEEE Control and Decision Conference (CDC), 5797–5802, (2013).

E. Carlini, M. Falcone, AF — **1.** *A brief survey on semi-Lagrangian schemes for Image Processing* Chapter of *Innovations for Shape Analysis: Models and Algorithms* Series: Mathematics and Visualization, Breuss, Bruckstein, Maragos, Petros (Eds.) 2013, XXIII, 494 p. 228

(NOTE: All articles included in this section are indexed on Scopus or WoS)

Conference papers

AF — **II.** *Domain Decomposition based Parallel Howard's Algorithm*, Proceedings of the The 21st International Symposium on Mathematical Theory of Networks and Systems, 1795–1797 (2014). (with peer-review)

AF, M. Falcone — **I.** *L^1 convergence of a SL scheme for the eikonal equation with discontinuous coefficient*, Proceedings of the 14th International Conference on Hyperbolic Problems: Theory, Numerics and Applications, 559–567 (2012). (with peer-review)

Dissertation

AF — **I.** *Analysis and approximation of Hamilton-Jacobi equations on irregular data*, Phd Thesis, published by LAP LAMBERT Academic Publishing, Saarbrücken, Germany.

Preprints and in Preparation

AF — **4*.** *Policy iteration algorithm for mean field games.* ArXiv, (2018).

AF, S. Cacace, R. Ferretti — **3*.** *Stochastic differential games and application to a match race problem.* ArXiv, (2018).

AF, P. Goatin — **2*.** *Modeling the impact of on-line navigation devices in traffic flows.* ArXiv, (2018).

AF, N. Forcadel, E. Carlini — **1*.** *A semi-Lagrangian scheme for Hamilton-Jacobi equations on networks and application to traffic flow models.* ArXiv, (2018).

AF, D. Kalise, MT. Wolfram — **-** *Control of a swarm of thinking agents.* In preparation.

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AF, P. Goatin - *Information in a multi-population traffic model.* In preparation.

E. Carlini, AF, N. Forcadel - *A mean field traffic model on networks.* In preparation.

(NOTE: The publications marked with * are preprints available on ArXiv submitted for publication.)

Contributions in Workshops

14-16/03/2018	Reunion ANR Mean Field Games, Tours, France.
4-9/06/2017	Journées SMAI 2017, La Rochelle, France.
23/03/2016	Journées SMAI-MODE 2016, ENSEEIHT, Toulouse, France.
16/11/2015	Workshop on Optimal Control of Partial and Ordinary Differential Equations, Ecole Polytechnique, Palaiseau, France.
29/1-31/01/2014	SADCO-WIAS Young Research Workshop, Berlin, Germany
27/1-28/1/2014	Industrial Workshop on "Safety Systems, Driver Assistance and Optimal Control", Wolfsburg, Germany
9/9-13/9/2013	OMPC13, Summer school and workshop on optimal and model predictive control, Bayreuth, Germany
21/12-23/01/2013	Young Researchers Workshop on System Dynamics and Optimal Control SADCO, Funchal, Portugal
12/12-14/14/2012	Workshop: Around Viability Boundaries, UPMC, Paris, France
03/09-07/09/2012	SADCO Summer school and Workshop, New Trends in Optimal Control, Ravello, Italy
25/06-29/06/2012	14th International Conference on Hyperbolic Problems, Padova, Italy
30/05-02/06/2012	12th Viennese Workshop on Optimal Control and Dynamic Games, UT, Wien, Austria
05/09-09/09/2011	SADCO Summer School and Workshop, Imperial College, London, UK
04/07-08/07/2011	Workshop, OPTPDE - Challenges in Applied Control and Optimal Design, BCAM, Bilbao, Spain
02/03-04/03/2011	Workshop Aerospace applications of control and optimization, Eads-Astrium, ENSTA, France
13/02-18/02/2011	Advancing numerical methods for viscosity solutions and applications, BIRS, Banff, Alberta, Canada

Selected presentations

24/07/2018	*Hamilton-Jacobi equations on networks and traffic flow models.* IFIP TC 7 Conference on System Modelling and Optimization, Essen.
11/07/2018	*A discrete Hughes model for pedestrian flow on graphs*. SMB18, Annual Meeting of the Society for Mathematical Biology & the Japanese Society for Mathematical Biology, Sydney, Australia.
07/07/2018	*Optimal Routing for Sailing Boats*. AIMS18, 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan.
06/07/2018	*Collision Avoidance for Pedestrian Dynamics*. AIMS18, 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan.
12/02/2018	*Conveyor Belts models*. Seminario di Modellistica differenziale, Sapienza University of Rome, Italy.
21/09/2017	*Collision Avoidance in Pedestrian Dynamics*. Scientific Computing Research Seminar, University of Mannheim, Germany.
10/07/2017	*Error bounds for first order constrained optimal control problems*. Control and application, SIAM Conference, Pittsburgh, USA.
04/07/2017	*Collision avoidence: Micro-macro models for pedestrians*. Seminars of the OPALE-INRIA group, Sophia Antipolis, France.
27/06/2017	*A semilagrangian numerical scheme for HJ equations on networks*. Biennial Numerical Analysis Conference, Strathclyde, Glasgow UK.
22/06/2017	*A hybrid control framework for route planning for sailing boats*. NUMOC17, Sapienza, Rome, Italy.
22/11/2016	*Independent domain decomposition for a class of Hamilton Jacobi equations*. Special Semester on Computational Methods in Science and Engineering, RICAM, Linz, Austria.
13/09/2016	*An Hybrid control approach for the sailing route planning problem*. SIMAI 16, Milano, Italy.
01/08/2016	*A Discrete Hughes Model for Pedestrian Flow on Graphs*. CMAM-7, Jyväskylä, Finland.
01/07/2016	*The Hughes model for pedestrian flow*. 11th AIMS Conf. DSDEA. Orlando, USA.
13/03/2016	*Semilagrangian schemes for macroscopic pedestrians models*. SMAI-MODE, Toulouse, France.
13/01/2016	*Pedestrian dynamics and collision avoidance.*. WONAPDE, Conception, Chile.
17/12/2015	*Collision avoidance in collective behaviors*. EEE-CDC15, Osaka, Japan.
14/10/2015	*Fast techniques of resolution for Hamilton Jacobi equations*. ENUMATH 2015, Ankara, Turkey.
7/07/2015	*A parallel version of the Howard's iteration algorithm*. 2015 SIAM Conference on Control and Its Applications (CT15), Paris, France.
29/06/2015	*Domain Decomposition techniques for Hamilton Jacobi equations* 27th IFIP TC7 Conference 2015 on System Modelling and Optimization, Sophia Antipolis, France.
23/06/2015	*Indipendent Domain Decomposition for Hamilton-Jacobi equations* 26th Biennial Numerical Analysis Conference, Glasgow, UK.

23/03/2015	*Application of independent sub-domains reconstruction to parallel computing.* GAMM Lecce, ITALY.
15/05/2015	*Collision avoidance for pedestrian motion*. 13th Viennese Workshop on Optimal Control and Dynamic Games. Vienna, AUSTRIA.
5/12/2014	*Independent sub-domains reconstruction and parallel computing*. Numerical methods for PDEs: optimal control, games and image processing. Rome, ITALY.
09/2014	*Convergence a Discrete Optimal Control Problem with State Constraints* Cascais, Portugal.
08/2014	*Revisiting Domain Decomposition for HJ equations*, HYP14, Rio, Brasil.
07/2014	*Parallel Howard's Algorithm*, MTNS14, Groningen, Netherland.
06/2014	*Independent Domain Decomposition and Parallel Computing*, NetCo14, Tours, France.
03/2014	*A Parallel Version of Policy Algorithm*, SMAI-MODE, Rennes, France.
12/2013	*Decomposition technique for Multi-Agent Differential Games* , EEE-CDC, Florence, Italy.
11/2013	*Une technique de décomposition pour les jeux de poursuite avec joueurs multiples*, LMBA, Brest, FR.
09/2013	*Error Bounds for a Discrete Optimal Control Problem with State Constraints* 16th French-German-Polish Conference on Optimization, Krakov, Poland.
07/2013	*A decomposition technique for multi-agents Games*, SIAM Conference on Control and Its Applications, San Diego, USA.
03/2013	*Decomposing a Pursuit-Evasion Games with Multi-Pursuer*, COMMANDS seminars, ENSTA, Paris.
11/2012	*Pursuit-Evasion Games with Multi-Pursuer: a decomposition approach*, Numerical Modelling Seminar of Mathematics Department Guido Castelnuovo of Rome.
07/2012	*An approximation scheme for an Eikonal Equation with discontinuous coefficient*, HYP2012, 14th International Conference on Hyperbolic Problems, Università di Padova, Italy.
05/2012	*Differential Games that Decompose into a Family of Optimal Control Problems.*, 12th Viennese Workshop on Optimal Control, Dynamic Games and Nonlinear Dynamics. TU, Wien.
01/2012	*Analysis and approximation of Hamilton-Jacobi equations on irregular data*, Numerical Modelling Seminar of Mathematics Department Guido Castelnuovo of Rome.
09/2011	*Numerical Resolution of an Eikonal equation on a Graph*, SADCO Summer School and Workshop, Imperial College, London.
01/2010	*A fast algorithm for image registration*, Numerical Modelling Seminar of Mathematics Department Guido Castelnuovo of Rome
09/2008	*A novel functional for the Optical flow problem* Simai 9th Congress, Rome.
05/2008	*Recent develops on Optical Flow*, Numerical Modelling Seminar of Mathematics Department Guido Castelnuovo of Rome

Personal skills and competences

Languages	Italian (Mother tongue), English (C2), French (C1), German (A2)
Computer skills	C/C++ - MPI - Java - Matlab - Mathematica - Maple

Other activities

2009 - 2013	Professional Navigator on race sailing yachts: Ops5 Baltic 60, ReadyXsea X35, Black Wings Farr53. International competitions: IOR world (2010, 2011, 2013), X35 Euro/world tourn.(2011, 2012, 2013).
2010 - 2013	Collaboration with North Sails – Centro Italia – assistance and dealing.

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