

PERSONAL INFORMATION

Marco Viola

 20, Via Dott. Ferdinando Rossi, 81100 Caserta (Italy)

 (+39) 0823 371367  (+39) 340 509 2026

 PERSONAL: marco.viola0491@gmail.com

 <https://it.linkedin.com/in/marcoviola91>

 <http://orcid.org/0000-0002-2140-8094>

 SCOPUS AUTHOR ID: 56911956100

 WEBSITE: <https://sites.google.com/view/marcoviola>

Sex Male | Nationality Italian

RESEARCH AND
TEACHING EXPERIENCE

01/05/2022–Present

Assistant Professor (fixed-term contract)

Department of Mathematics and Physics, University of Campania “L. Vanvitelli”, Caserta (Italy)

Fixed-term researcher of type A (RTD-A) in the field of Numerical Analysis (Italian SSD: MAT/08)

01/09/2019–30/04/2022

Postdoctoral Research Fellow

Department of Mathematics and Physics, University of Campania “L. Vanvitelli”, Caserta (Italy)

DESCRIPTION: Study and development of efficient numerical methods for large-scale nonlinear optimization with applications to machine learning and image processing problems

SUPERVISOR: Prof. Daniela di Serafino

01/2022–02/2022

Contract Professor

Department of Agricultural Sciences – University of Naples “Federico II”, Portici (Italy)

DESCRIPTION: I have been appointed to be convener for a module on “Fundamentals of Optimization” for students enrolled onto the “Advanced Master in Agricultural Politics and Economy” for a total of 14 hours of classroom-taught lesson.

14/09/2019–27/09/2019

Visiting Researcher

Department of Mathematics and Informatics, University of Novi Sad, Novi Sad (Serbia)

DESCRIPTION: Study and development of stochastic optimization method for machine learning. The visiting was sponsored by the “Executive programme of cooperation in the field of science and technology between the Italian Republic and the Republic of Serbia for the years 2019-2021”. Project: “Second order methods for optimization methods in machine learning” (RS19MO05).

SUPERVISOR: Dr. Nataša Krklec Jerinkic

17/07/2019–04/08/2019

Short-term Visiting Scholar

Department of Mathematics, University of Florida, Gainesville (FL, USA)

DESCRIPTION: Study and development of subspace-accelerated gradient-based algorithm for Quadratic Programming problems.

SUPERVISOR: Prof. William W. Hager

17/06/2019–31/08/2019

Research Assistant in Numerical Analysis

Department of Agricultural Sciences – University of Naples “Federico II”, Portici (Italy)

DESCRIPTION: Parameter optimization problems for ODE and PDE systems with application to biological models

SUPERVISOR: Prof. Francesco Giannino

11/2018–01/2019 **Graduate Teaching Assistant**

Department of Mathematics and Physics, University of Campania "L. Vanvitelli", Caserta (Italy)

COURSE: Numerical Analysis 1 (BSc in Mathematics)

01/02/2018–30/06/2018 **Visiting Graduate Scholar**

Department of Applied Mathematics and Statistics, Johns Hopkins University, Baltimore (MD, USA)

DESCRIPTION: Study and development of active-set algorithms for the solution of Total Variation regularized Machine Learning problems.

SUPERVISOR: Dr. Daniel P. Robinson

11/2017–12/2017 **Graduate Teaching Assistant**

Department of Mathematics and Physics, University of Campania "L. Vanvitelli", Caserta (Italy)

COURSE: Numerical Analysis 1 (BSc in Mathematics)

21/05/2017–10/06/2017 **Visiting Scholar**

Department of Applied Mathematics - Faculty of Electrical Engineering and Computer Science - VŠB-Technical University of Ostrava, Ostrava (Czech Republic)

DESCRIPTION: Study and development of Quadratic Programming and Quadratic Constrained QP algorithms with applications to the solution of contact problems and SVM.

SUPERVISOR: Prof. RNDr. Zdeněk Dostál, DSc

04/2017–06/2017 **Graduate Teaching Assistant**

Department of Mathematics and Physics, University of Campania "L. Vanvitelli", Caserta (Italy)

COURSE: Numerical Analysis 2 (BSc in Mathematics)

1/07/2015–31/10/2015 **Postgraduate Research Assistant in Numerical Analysis**

Department of Mathematics and Applications, University of Naples "Federico II", Napoli (Italy)

"Mathematical and Computational Models inspired to Biological Neural Networks for User Profiling in Cultural Heritage contests." -- PON03PE_00099_1/15 "Cultural Heritage Information System (CHIS)" - CUP E68C14000030005

MAIN EDUCATION

1/11/2015–26/02/2019 **Research Doctorate (PhD degree)**

EQF level 8

Department of Computer, Control, and Management Engineering "A. Ruberti" - Sapienza University of Rome, Rome (Italy)

COURSE TITLE: Research Doctorate in "Automatica, Bioengineering and Operations Research"

NOTE: I was awarded by Sapienza University a scholarship for the full length of the PhD program

PHD THESIS: "Gradient-based methods with subspace acceleration for quadratic programming problems and applications"

THESIS ADVISORS: Prof. Gerardo Toraldo (University of Naples "Federico II"), Prof. Massimo Roma (Sapienza University of Rome), CO-ADVISOR: Prof. Daniela di Serafino (University of Campania "L. Vanvitelli")

31/10/2012–24/02/2015

M.Sc. in Mathematics

EQF level 7

University of Naples "Federico II", Napoli (Italy)

FINAL DEGREE MARK: 110/110 summa cum laude

THESIS: "Data Classification and Feature Selection using a Generalized Eigenvalues Classifier with L1-regularization"

ADVISORS: Prof. Gerardo Toraldo (Università degli Studi di Napoli "Federico II"), Dr. Mario R. Guarracino (Istituto di Calcolo e Reti ad Alte Prestazioni, ICAR-CNR)

11/2014–12/2014

Research Intern for MSc dissertation

Istituto di Calcolo e Reti ad Alte Prestazioni, ICAR-CNR, Napoli (Italy)

DESCRIPTION: Study and development of novel algorithms, methods and software for Supervised Classification: analysis of classifiers based on the solution of Generalized Eigenvalues problems and the possibility of using regularization terms to improve their performances.

SUPERVISOR: Dr. Mario R. Guarracino

18/09/2009–25/10/2012

B.Sc. in Mathematics

EQF level 6

Second University of Naples, Caserta (Italy)

FINAL DEGREE MARK: 110/110 summa cum laude

THESIS: "Introduzione ai metodi Multigrid per la risoluzione di equazioni differenziali ellittiche" (Introduction to Multigrid methods for the solution of elliptic partial differential equations)

ADVISOR: Prof. Daniela di Serafino

RESEARCH CONTRIBUTION

Journal articles

1. L. Antonelli, V. De Simone, **M. Viola**: "Cartoon-texture evolution for two-region image segmentation", Computational Optimization and Applications, 2022
2. V. De Simone, D. di Serafino, J. Gondzio, S. Pougkakiotis, **M. Viola**, "Sparse Approximations with Interior Point Methods", to appear on SIAM Review, 2021
3. D. di Serafino, G. Landi, **M. Viola**: "Directional TGV-based image restoration under Poisson noise", Journal of Imaging, 7 (6), p. 99, 2021
4. D. di Serafino, G. Toraldo, **M. Viola**: "Using gradient directions to get global convergence of Newton-type methods", Applied Mathematics and Computation, article 125612, 2020
5. V. De Simone, D. di Serafino, **M. Viola**: "A subspace-accelerated split Bregman method for sparse data recovery with joint l1-type regularizers", Electronic Transactions on Numerical Analysis, 53, pp.406-425, 2020
6. D. di Serafino, G. Landi, **M. Viola**: "ACQUIRE: an inexact iteratively reweighted norm approach for TV-based Poisson image restoration", Applied Mathematics and Computation, 364, article 124678, 2020
7. **M. Viola**, M. Sangiovanni, G. Toraldo, M.R. Guarracino: "Semi-supervised Generalized Eigenvalues Classification", Annals of Operations Research, 276, pp. 249-266, 2019
8. D. di Serafino, G. Toraldo, **M. Viola**, J. Barlow: "A two-phase gradient method for Quadratic Programming problems with a single linear constraint and bounds on the variables", SIAM Journal on Optimization, 28(4), pp. 2809–2838, 2018
9. **M. Viola**, M. Sangiovanni, G. Toraldo, M.R. Guarracino: "A Generalized Eigenvalues Classifier with Embedded Feature Selection", Optimization Letters, 11(2), pp. 299–311, 2017
10. D. di Serafino, G. Landi, **M. Viola**: "TGV-based restoration of Poissonian images with automatic estimation of the regularization parameter", To appear in "Proceedings of the 21st International Conference on Computational Science and Its Applications (ICCSA)", 2021
11. D. di Serafino, G. Toraldo, **M. Viola**: "A gradient-based globalization strategy for the Newton method", In: Y. D. Sergeyev and D. E. Kvasov (Eds.): NUMTA 2019, Lecture Notes in Computer Science, vol 11973, pp. 177–185, 2020
12. Z. Dostál, G. Toraldo, **M. Viola**, O. Vlach: "Proportionality-based gradient methods with applications in contact mechanics", In: Kozubek T. et al. (eds) High Performance Computing in Science and Engineering. HPCSE 2017. Lecture Notes in Computer Science, vol 11087, 2018

Peer-reviewed
conference proceedings

13. M.R. Guarracino, M. Sangiovanni, G. Severino, G. Toraldo, **M. Viola**: "On the regularization of generalized eigenvalues classifiers", Proceedings of the 2nd International Conference "Numerical Computations: Theory and Algorithms", AIP Conference Proceedings, 2016
14. M. Liberini, S. Esposito, K. Reshad, B. Previtali, **M. Viola**, A. Squillace: "Development of an innovative method to predict and to characterize the performances of Ti-6Al-4V LBW joints", Proceedings of the 19th International ESAFORM Conference on Material Forming, AIP Conference Proceedings, 2016
- Submitted papers**
15. D. di Serafino, N. Krejic, N. Krklec Jerinkic, **M. Viola**: "LSOS: Line-search Second-Order Stochastic optimization methods for nonconvex finite sums", available on arXiv: 2007.15966, 2021
16. D. di Serafino, W. W. Hager, G. Toraldo, M. Viola: "On the stationarity for nonlinear optimization problems with polyhedral constraints", 2022
- Invited Seminars**
- 09/12/2020 - "Combining Newton-type and steepest descent directions to achieve global convergence", PRIMO Talks series [virtual event].
 - 19/11/2020 - "Using gradient directions to get global convergence of Newton-type methods", Seminars on Numerical Mathematics, Department of Mathematics and Informatics, University of Novi Sad, Novi Sad (Serbia), Organizer: Prof. Nataša Krklec Jerinkic [virtual event]
 - 27/03/2019 - "Subspace acceleration techniques in gradient-projection methods for quadratic programming", Department of Mathematics, University of Bologna, Bologna (Italy).
 - 14/12/2017 - "Quadratic programming problems on the simplex: algorithms and applications", Department of Mathematics and Applications, University of Naples "Federico II", Napoli (Italy).
 - 08/06/2017 - "Introducing P2GP (Proportionality-based 2-phase Gradient Projection) method. Theoretical background and applications.", Seminar in Computational Sciences held at the "IT4Innovations national computing center" of the VŠB – Technical University of Ostrava.
- Conference/Sessions Organization activity**
- Co-organizer of the INdAM Workshop "ATOMI" (Advanced Techniques in Optimization for Machine learning and Imaging), 20-24/06/2022, Roma (Italy).
 - Member of the Local Organizing Committee of the "Two Days of Numerical Linear Algebra and Applications" workshop, 14-15/02/2022, Napoli (Italy).
 - Co-organizer of the "PRIMO Workshop", a 3-day workshop for early career researchers in applied mathematics, 11-13/10/2021, Bologna (Italy).
 - Organizer of the minisymposium "Numerical Advances in Data Analysis and Machine Learning" at the "2021 SIAM Conference on Computational Science and Engineering", co-organizer: Dr. Rosanna Campagna (University of Campania "L. Vanvitelli"), 01-05/03/2021 [virtual event]
 - Organizer of the minisymposium on "Large-scale Optimization and Applications" at the "2020 edition of the bi-annual congress of the Italian Society of Applied and Industrial Mathematics (SIMA2020)", co-organizer: Dr. Federica Porta (University of Modena and Reggio Emilia), 30/08-03/09/2021, Parma (Italy)
 - Organized a special session titled "First order methods in optimization: theory and applications" at the "3rd International Conference and Summer School Numerical Computations: Theory and Algorithms (NUMTA 2019)", co-organizer: Simone Rebegoldi (University of Modena and Reggio Emilia), 15-21/06/2019, Le Castella, Isola Capo Rizzuto (Italy)
- Conference talks (2017-)**
- 03-06/07/2022 – Talk in invited session titled "Efficiently combining first- and second-order directions in neural network training" at the EURO2022 Conference, Helsinki (Finland)
 - 13-16/09/2021 – Talk in invited session titled "TGV-based restoration of Poissonian images with automatic estimation of the regularization parameter" at the "21st International Conference on Computational Science and its Applications (ICCSA 2021)", Cagliari (Italia) [online participation]
 - 17-21/05/2021 – Talk in invited session titled "Restoration of Directional Images in Presence of Poisson Noise" at the "2021 SIAM Conference on Applied Linear Algebra (LA21)" [virtual event]
 - 13-15/04/2021 – Talk in invited session titled "Restoring Poissonian images with one-directional texture" at the "ECMI2021 Conference", Bergische Universität Wuppertal (Germany) [virtual event]
 - 14-15/12/2020 – Talk in invited session titled "Line-search second-order methods for optimization in noisy environments" at the "BOS/SOR 2020 Conference", Warsaw (Poland) [virtual event]

- 31/01/2020 – Talk titled “*Second order methods for optimization in noisy environments*” at the “Metodi di ottimizzazione per l’apprendimento automatico e l’elaborazione di immagini” Working Day, 2019 Projects of the “Gruppo Nazionale per il Calcolo Scientifico” (GNCS) of the “Istituto Nazionale di Alta Matematica” (INdAM), Università degli Studi di Firenze, Firenze (Italy)
- 15-21/06/2019 – Talk titled “*A gradient-based globalization strategy for the Newton method*” at the “3rd International Conference and Summer School Numerical Computations: Theory and Algorithms (NUMTA 2019)”, Le Castella, Isola Capo Rizzuto (Italy)
- 25-26/04/2019 – Talk in invited session titled “*A subspace-accelerated method for the minimization of joint l_1 - and TV -regularized functions with application to machine learning on fMRI data*” at the 2nd IMA and OR Society Conference on Mathematics of Operational Research, Aston University, Birmingham (United Kingdom)
- 25-28/09/2017 - Talk in invited session titled “*P2GP: a proportioning-based two-phase gradient algorithm for QP problems with bounds on the variables and a linear constraint*” at the 18th French-German-Italian Conference on Optimization, University of Paderborn, Paderborn (Germany)
- 4-7/09/2017 – Talk in invited session titled “*Using a two-phase gradient projection method in IRN minimization for Poisson image restoration*” at the Optimization and Decision Science 2017 (47th Annual Meeting of the Italian Operations Research Society), Hilton Sorrento Palace Conference Center, Sorrento (Italy)
- 22-25/05/2017 – Contributed talk titled “*Sparse Poisson image restoration via iterative reweighted LS and 2-phase gradient projection methods*” at the High Performance Computing in Science and Engineering (HPCSE2017), Hotel Soláň, Karolinka (Czech Republic)

Other Activities

- *Founder* of the PRIMO (Post graduate Researchers in Inverse problems, Machine learning and Optimization) group.
- *Co-organizer* of the “PRIMO Talks” online seminar series
- *Reviewer* for: Computational Optimization and Application (COAP), Optimization Letters (OPTL), SIAM Journal on Scientific Computing (SISC), Annals of Operations Research (ANOR), Applied Mathematics and Computation (AMC), 4 OR, Computational and Applied Mathematics (COAM), Numerical Algorithms (NUMA). Member of the Reviewer Board of the MDPI Algorithms journal.
- *Member* of the Society for Industrial and Applied Mathematics (SIAM)
- *Member* of the “Gruppo Nazionale di Calcolo Scientifico” (GNCS) of the Istituto Nazionale di Alta Matematica “F. Severi” (INdAM).
- *Member* of the Unione Matematica Italiana (UMI)