Dr. Serena Crisci

Curriculum vitae

EDUCATION

A.Y. 2019: Ph.D. in Mathematics, University of Modena and Reggio Emilia, Modena (Italy)

Thesis title: *Spectral properties of gradient-based methods for optimization problems with special constraints*

A.Y. 2013/2014: MS Degree cum laude in Mathematics, University of Naples *Federico II*, Naples (Italy)

Thesis title: *Un protocollo crittografico su gruppi non abeliani* (*A cryptographic protocol based on non-abelian groups*)

A.Y. 2010/2011: BS Degree cum laude in Mathematics, University of Naples *Federico II*, Naples (Italy)

Thesis title: Le *trasformazioni geometriche del piano: dal piano di Hilbert al piano iperbolico* (*Geometric transformations of the plane: from the Hilbert plane to the hyperbolic plane*)

POSITION

Jan. 2022 – present: Non-tenured Assistant Professor (RTD-A), Department of Mathematics and Physics, University of Campania *Luigi Vanvitelli*, Caserta (Italy)

Research interest: applied mathematics, first-order methods for nonlinear optimization with applications in imaging and machine learning, inverse problems, regularization methods.

PAST POSITIONS AND EXPERIENCE

Apr. 2021 – Dec. 2021: Postdoc fellowship, University of Campania *Luigi Vanvitelli*

Jan. 2021 – March 2021: Consulting agreement, University of Ferrara. Project: *ELementi per l'implementazione di Agricoltura di Precisione nelle coltivazioni cerealicole e industriali della provincia di FErrara. Un'applicazione attraverso metodologie di machine learning* (ELAP-Fe).

Apr. 2020 – March 2021: Postdoc fellowship, University of Modena and Reggio Emilia

Sept. 2019 – Oct. 2019: Visiting period at the Department of Applied Mathematics, VSB-Technical University of Ostrava (Czech Republic) collaborating with Prof. Zdenek Dostal's research group in research on fast gradient methods and their applications

Jan. 2016 – June 2017: Research activity in collaboration with Prof. Salvatore Cuomo (Dept. of Mathematics and Application, University of Naples *Federico II*) on image analysis and denoising algorithms

2015: Research grant in the frame of *WISCh project - Work Into Shaping Campania's Home* at Ce.S.M.A. Institute (Centro Servizi Metrologici Avanzati) - University of Naples *Federico II* , Naples (Italy). Title of the project*: Image analysis, segmentation and denoising algorithms in high performance computing*

RESEARCH PROJECTS

INdAM-GNCS 2023, (PI) Project: Modelli e metodi avanzati in Computer Vision – Advanced models and methods in Computer Vision

INdAM-GNCS 2022, Project: Ottimizzazione adattiva per il Machine Learning – Adaptive optimization for Machine Learning

Project: VArIational methods and Numerical techniques: sHape Optimization and nonlinear Partial differential EquationS - VAIN-HOPES, 2019 V:ALERE (VAnviteLli pEr la RicErca) Program of the University of Campania "Luigi Vanvitelli".

Project: Second-order methods for optimisation problems in machine learning, Executive Program of Cooperation in the Field of Science and Technology between the Italian Republic and the Republic of Serbia, funded by Italian Ministry of Foreign Affairs and International Cooperation and Serbian Ministry of Education, Science and Technological Development.

INdAM-GNCS 2020, Project: Ottimizzazione per l'apprendimento automatico e apprendimento automatico per l'ottimizzazione Optimisation for Machine Learning and Machine Learning for optimization

INdAM-GNCS 2019, Project: Tecniche adattive per metodi di ottimizzazione in Machine Learning - Adaptive techniques for optimization methods in Machine Learning

INdAM-GNCS 2018, Project: Metodi di ottimizzazione stocastica per problemi di apprendimento automatico a larga scala Stochastic optimization methods for large-scale machine learning problems

GRANTS

2021: Young Researchers Grant INdAM-GNCS. Title of the project: Steplength selection techniques in gradient-based methods for constrained optimisation problems.

WORKSHOPS/MINISYMPOSIA/SEMINARS ORGANIZATION

2023: Minisymposium *Machine learning and optimization for industry and society,* Math 2 Product (M2P) Emerging Technologies in Computational Science for Industry, Sustainability and Innovation, May 31- June 1 2023, Taormina (Italy) (co-organizer)

2022: Minisymposium *Novel perspectives in optimization and machine learning for imaging,* SIAM Conference on Imaging Science 2022, March 21-25, 2022 (co-organizer)

2021: *PRIMO Workshop 2021*, University of Bologna, Oct. 11-13, 2021, Bologna, Italy (co-organizer)

2020-2021: PRIMO group seminars. Cycle of online seminars (co-organizer)

2020: Special session *Advances in optimization techniques for machine learning,* BOS/SOR 2020 Conference, Systems and Operational Research 2020, Polish Operational and Systems Research Society, Dec. 14-15, 2020 (co-organizer)

SCIENTIFIC AFFILIATION

Member of the National research group of Scientific Computing - Gruppo Nazionale di Calcolo Scientifico, INdAM-GNCS.

Member of the OASIS (Optimization, Algorithms and Software for Inverse Problems) interuniversity italian research group

Member and co-founder of the PRIMO (Post-graduate Researchers in Inverse problems, Machine learning, and Optimization) research group.

REVIEW ACTIVITY

Computational Optimization and Applications, Journal of Global Optimization, Mathematics of Computation, Optimization letters, Mathematics of Computation and Data Science (specialty section di Frontiers in Applied Mathematics and Statistics).

PUBLICATIONS

1. Crisci, S., De Simone, V., Viola, M. (2023). On the Adaptive Penalty Parameter Selection in ADMM. *Algorithms*, 16(6), 264. https://doi.org/10.3390/a16060264

2. Crisci, S., Porta, F., Ruggiero, V., Zanni, L., Hybrid limited memory gradient projection methods for box-constrained optimization problems. *Computational Optimization and Applications*, 1-39, 2022. WOS:000849877300001. ID-Scopus: 2-s2.0-85137429674.

3. Crisci, S., Porta, F., Ruggiero, V., Zanni, L., On the convergence properties of scaled gradient projection methods with non-monotone Armijo–like line searches. *ANNALI DELL'UNIVERSITA' DI FERRARA*, 1-34, 2022. ID-Scopus: 2-s2.0-85137059806.

4. Cabri, G., Crisci, S., Montangero, M. (2022). Traffic Flow Modelling When Autonomous Vehicles Coexist with Human Driven Vehicles: Perspectives and Challenges. In: Camacho, D., Rosaci, D., Sarné, G.M.L., Versaci, M. (eds) Intelligent Distributed Computing XIV. IDC 2021. Studies in Computational Intelligence, vol 1026. Springer, Cham. https://doi.org/10.1007/978-3-030-96627-0_16. ID-Scopus: 2-s2.0-85130262465.

5. Crisci S., Piana M., Ruggiero V., Scussolini M., A regularized affine-scaling Trust-Region method for parametric imaging of dynamic PET data, *SIAM Journal on Imaging Sciences*, 14(1), 418–439, 2021. WOS:000637582300015. ID Scopus: 2-s2.0-85108224018.

6. Crisci S., Kružík J., Pecha M., Horak D., Comparison of active-set and gradient projection-based algorithms for box-constrained quadratic programming. *Soft Computing*, 24, 17761-17770, 2020. ISSN: 1432-7643. WOS:000583096300003. ID Scopus: 2-s2.0-85092907587.

7. Crisci S., Porta F., Ruggiero V., Zanni L., Spectral properties of Barzilai-Borwein rules in solving singly linearly constrained optimization problems subject to lower and upper bounds. *SIAM Journal on Optimization*, Vol. 30, No. 2, pp. 1300-1326, 2020. ISSN: 1052-6234. WOS:000547000900011. ID Scopus: 2-s2.0-85085250837.

8. Crisci S., Porta F., Ruggiero V., Zanni L., A Limited Memory Gradient Projection Method for box-constrained quadratic optimization problems. In: Sergeyev Y., Kvasov D. (eds) Numerical Computations: Theory and Algorithms. NUMTA 2019. *Lecture Notes in Computer Science*, vol. 11973. Springer. WOS:000593968500015. ID Scopus:2-s2.0-85080897962.

9. Crisci S., Ruggiero V., Zanni L., Steplength selection in gradient projection methods for box-constrained quadratic programs, *Applied Mathematics and Computation*, Volume 356, Pages 312-327, 2019. ISSN: 0096-3003. WOS:000464931100022. ID Scopus: 2-s2.0-85063648311.

10. R. Campagna, S. Crisci, S. Cuomo, L. Marcellino, G. Toraldo, Modification of TV-ROF denoising model based on Split Bregman iterations, *Applied Mathematics and Computation*, Volume 315, Pages 453-467, 2017. ISSN: 0096-3003. WOS:000412253200035. ID Scopus: 2-s2.0-85027527667

11. R. Campagna, S. Crisci, S. Cuomo, A. Galletti, L. Marcellino, A second order derivative scheme based on Bregman algorithm class In: AIP Conference Proceedings. vol. 1776, American Institute of Physics Inc., ISBN: 9780735414389, (2016), doi: 10.1063/1. ID Scopus: 2-s2.0-84995520698.

12. R. Campagna, S. Crisci, S. Cuomo, P. De Michele, A. Galletti, L. Marcellino and A. Murano (2016) , A novel Split Bregman algorithm for MRI denoising task in an e-Health system, In: ACM International Conference Proceeding Series. 78, ISBN: 978-145034337-4, (2016), doi: 10.1145/2910674.2910692. ID Scopus: 2-s2.0-85006070936.