

PERSONAL INFORMATION

Matteo Lapucci

Gender Male | Nationality Italian

WORK EXPERIENCE

November 2021 – Today

Postdoctoral Research FellowGlobal Optimization Laboratory, DINFO, School of Engineering, University of Florence
Via di Santa Marta, 3, 50139, Firenze, Italia

- Study of exact and inexact optimization methods for airport personnel scheduling problems
- Teaching; thesis advisory; research on operations research and machine learning topics.

December 2020 – February 2021

Software Engineer - Term ContractGlobal Optimization Laboratory, DINFO, School of Engineering, University of Florence
Via di Santa Marta, 3, 50139, Firenze, Italia

- Design and development of a full-stack web application for the optimal scheduling of groups of tourists accessing cultural heritage sites taking into account social distancing constraints related to the COVID-19 pandemic.

July 2018 – September 2018

Software Engineer - Term ContractGlobal Optimization Laboratory, DINFO, School of Engineering, University of Florence
Via di Santa Marta, 3, 50139, Firenze, Italia

- Research on operations research and machine learning topics.
- Design and development of a full-stack web interface to a tool for optimal tournament schedules generation, in the context of a collaboration project with "Lega Pallavolo Serie A".

EDUCATION AND TRAINING

November 2018 – October 2021

PhD in Smart ComputingJoint Program from the Universities of Florence, Siena and Pisa.
Title obtained cum laude.

Affiliation Global Optimization Laboratory, DINFO, School of Engineering, University of Florence

Thesis: Theory and Algorithms for Sparsity Constrained Optimization Problems.
Discussed on 22nd February 2022.Main Research Topics: -Methods for constrained, sparse, large scale and multi-objective non-linear optimization.
-Optimization methods for machine learning and statistics problems.

Projects -SeaFactory: optimization models for the fishing industry.

Courses: Derivative-Free Optimization; Applications and methods of stochastic modeling and quantitative evaluation; Object Recognition in Images and Videos; Modern Convex Optimization; Introduction to Generative Adversarial Networks; Linear and Nonlinear Kalman Filtering; Methods for Constrained Optimization; Graph-based Clustering Methods; Explainable AI; Mathematical Optimization in Machine Learning;

Schools: Summer School on Big Data, Optimization and Applications, Veroli, 2019.
AIRO PhD School, Virtual event, 2021

October 2015 – April 2018

Master's Degree in Computer EngineeringSchool of Engineering, University of Florence.
Final Grade: 110/110 summa cum laude.

Thesis: A New Class of ADMM Methods and Applications to SVM Training Problems (Supervisor: Prof. M. Sciandrone).

Courses: Advanced Numerical Analysis, Data and Document Mining, Optimization Methods, Image and Video Analysis, Theory of Computation, Information Theory and Coding, Optimization of Complex Systems, Human Computer Interaction, Machine Learning, Image Processing and Security, Telecommunication Networks, Software Architectures and Methodologies, Computer Vision.

Weighted Average Grade: 30/30 (number of 30/30 cum laude: 7).

September 2012 – October 2015 Bachelor's Degree in Computer Engineering

School of Engineering, University of Florence.

Final Grade: 110/110 summa cum laude.

Thesis: A Study about the Effects of Image Compression on a Tool for Automated Mouse Brain Cells Detection (Supervisor: Prof. P. Frasconi).

Courses: Foundations of Computer Programming, Mathematical Analysis, Geometry and Linear Algebra, General Physics, I.T. Laboratory, Circuit Theory, Electronics, Mathematical Methods for Computer Engineering, Foundations of Operations Research, Computer Architectures, Signal Processing and Transmission, Foundations of Automation, Algorithms and Data Structures, Databases Software Engineering, Artificial Intelligence, Abstract Algebra and Coding Theory, Multimedia Design and Production, Foundations of Telecommunications, Foundations of Telematics, Embedded Systems.

Weighted Average Grade: 29.54/30 (number of 30/30 cum laude: 7).

September 2007 – July 2012 Secondary School Diploma - "Liceo Scientifico"

ISIS "Giovanni da Castiglione", Castiglione Fiorentino (AR), Italy

Final Grade: 100/100.

Subjects: Mathematics, Latin, Italian Literature, English, Physics, History, Philosophy, Natural Sciences, Art History, Geography, Physical Education.

AWARDS AND ACKNOWLEDGEMENTS

April 2019 Degree Prize

Assigned to the top three graduates in Computer Engineering from the University of Florence in 2018.

April 2018 Solemn Commendation

Assigned unanimously by the Master's Degree Board for the exceptional curriculum studiorum.

February 2016 Best Graduate of the School of Engineering Honor

Awarded at the "Best Graduates" Ceremony of the University of Florence to the best graduate from each School for the A.A. 2014/15.

CERTIFICATIONS

February 2020 Professional Engineering Licence (Italian Legislation)

Italian Association of Engineers

March 2012 First Certificate in English (CEFR Level B2)

Cambridge Assessment English

PERSONAL SKILLS

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C1	B2	B2	C1
French	A1	B1	A1	A1	A2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2: Proficient user
[Common European Framework of Reference \(CEF\) level](#)

Main Professional Interests	<p><i>Operations Research:</i> Constrained Nonlinear Optimization, Sparse Optimization, Multi-objective Optimization, Decomposition Techniques, Applications to Machine Learning and Statistics, MIP Modeling.</p> <p><i>Machine Learning:</i> Logistic Regression, Decision Trees, Support Vector Machines, Kernel Methods, Deep Learning, Interpretable Models.</p>
Other skills	<p><i>Data Processing:</i> Signal and Image Processing, Video Analysis, Computer Vision.</p> <p><i>Software Engineering:</i> Full Stack Web Applications Design and Development.</p>
Social skills	Predisposition and enthusiasm for teamwork and leadership aptitude, built up in the university and the sport contexts.
Technological Skills	<p><i>Coding:</i> C, C++, Java, Python, Matlab, Javascript, Typescript, HTML, CSS, SQL, Scripting Bash.</p> <p><i>Tools and Environments:</i> Linux, Windows, Latex, J2EE, Django, MySQL, Angular 2+, Bootstrap, Tensorflow, StarUML, Arduino, Git, Microsoft Office, Gurobi, Pyomo, OR-Tools.</p>
Other Interests	Sports, Current Affairs, Science, History, Stories.
Other Activities	<i>Competitive Volleyball</i> (2004 – today).
Driving licence	B

LIST OF PUBLICATIONS

March 2022	M. Lapucci. "A Penalty Decomposition Approach for Multi-objective Cardinality-Constrained Optimization Problems". <i>Optimization Methods and Software</i> .
February 2022	M. Lapucci, D. Pucci. "Mixed-Integer Quadratic Programming Reformulations of Multi-Task Learning Models". <i>Mathematics in Engineering</i> .
December 2021	L. Di Gangi, M. Lapucci, F. Schoen, A. Sortino. "Improved improved Maximum Likelihood Estimation of ARMA Models". <i>Lobachevsky Journal of Mathematics</i> .
November 2021	R. Bisori, M. Lapucci, M. Sciandrone. "A study on sequential minimal optimization methods for standard quadratic problems". <i>4OR</i> .
October 2021	F. Ceccarelli, M. Lapucci, G. Olivieri, A. Sortino, F. Natalucci, F. R. Spinelli, C. Alessandri, M. Sciandrone, F. Conti. "Can Machine Learning models support physicians in Systemic Lupus Erythematosus diagnosis? Results from a monocentric cohort". <i>Joint Bone Spine</i> .
August 2021	G. Cocchi, M. Lapucci, P. Mansueto. "Pareto front approximation through a multi-objective augmented Lagrangian method". <i>EURO Journal on Computational Optimization</i> .
June 2021	E. Civitelli, M. Lapucci, F. Schoen, A. Sortino. "An effective procedure for feature subset selection in logistic regression based on information criteria.". <i>Computational Optimization and Applications</i> .

February 2021	F. Ceccarelli, G. Olivieri, A. Sortino, M. Lapucci, M. Sciandrone et al.. "Comprehensive Disease Control in Systemic Lupus Erythematosus". <i>Seminars in Arthritis and Rheumatism</i> .
January 2021	G. Galvan, M. Lapucci, C.-J. Lin, M. Sciandrone. "A Two-Level Decomposition Framework Exploiting First and Second Order Information for SVM Training Problems". <i>Journal of Machine Learning Research</i> .
December 2020	M. Lapucci, T. Levato, M. Sciandrone. "Convergent Inexact Penalty Decomposition Methods for Cardinality-Constrained Problems". <i>Journal of Optimization Theory and Applications</i> .
June 2020	G. Cocchi, M. Lapucci. "An augmented Lagrangian algorithm for multi-objective optimization". <i>Computational Optimization and Applications</i> .
September 2019	L. Di Gangi, M. Lapucci, F. Schoen, A. Sortino. "An efficient optimization approach for best subset selection in linear regression, with application to model selection and fitting in autoregressive time-series". <i>Computational Optimization and Applications</i> .
March 2019	G. Galvan, M. Lapucci. "On the convergence of inexact Augmented Lagrangian methods for problems with convex constraints". <i>Operations Research Letters</i> .
January 2019	G. Galvan, M. Lapucci, T. Levato, and M. Sciandrone. "An Alternating Augmented Lagrangian Method for Constrained Nonconvex Optimization". <i>Optimization Methods and Software</i> .
LIST OF TALKS AT CONFERENCES	
September 2021	ODS 2021 (Rome) - A Unifying Framework for Sparsity Constrained Optimization Problems.
August 2021	SIMAI 2020+2021 (Parma - virtual) - A Two-Level Decomposition Framework Exploiting First and Second Order Information for SVM Training Problems.
July 2021	SIAM OP 2021 (Virtual Conference) - A Penalty Decomposition Approach for Multi-Objective Cardinality-Constrained Optimization Problems
July 2021	EUROPT 2021 (Toulouse - virtual) - A Derivative-free Adaptation of the Penalty Decomposition Method for Sparse Optimization
September 2019	ODS 2019 (Genova) - An efficient optimization approach for best subset selection in linear regression.
TEACHING	
March 2022	<i>Optimization</i> (1.5 CFU) 2nd Level Master Course in Data Science and Statistical Learning, UNIFI.
December 2021	<i>Optimization Techniques for Machine Learning</i> (12h lectures on Optimization Algorithms for Learning Problems) Master's degree programs in Computer Engineering and Artificial Intelligence, UNIFI.
May 2021	<i>Optimization of Complex Systems</i> (12h lectures on Sparse Optimization) Master's degree program in Computer Engineering, UNIFI.
November 2020	<i>Foundations of Operations Research</i> (1h seminar on application of OR methodologies for the optimal scheduling of tourists in the pandemic context) Bachelor's degree program in Computer Engineering, UNIFI.
May 2019	<i>Models and Algorithms for Organization and Management</i> (3h lecture on SVM classifiers) Master's degree program in Mechanical Engineering, UNIFI.

March 2019 *Optimization of Complex Systems* (1h seminar on decomposition methods for SVM training)
Master's degree program in Computer Engineering, UNIFI.

ORGANIZATION

September 2022 Member of the *Organizing Committee* of the "International Conference on Optimization and Decision Science" (ODS) 2022, Florence, Italy.

September 2022 *Chair* of 2 Invited Sessions on "Nonlinear Optimization and Machine Learning" - ODS 2022 Conference, Florence, Italy.

July 2022 Member of the *Organizing Committee* of the "Summer School on Optimisation, Big Data and Applications" (OBA), Third Edition, Veroli (FR), Italy.

THESIS ADVISOR

Bachelor's Thesis Co-Advisor 14 students in Computer Engineering

Master's Thesis Co-Advisor 2 students in Computer Engineering

PEER-REVIEW ACTIVITY

Reviewer Activity:

- Computational Optimization and Applications: 3 papers;
- Optimization Methods and Software: 6 papers;
- 4OR: 1 paper;
- Soft Computing: 1 paper;
- European Journal of Operational Research: 1 paper;
- Journal of the Operational Research Society of China: 1 paper;
- Acta Mathematicae Applicatae Sinica: 1 paper;
- INFORMS Journal on Computing: 1 paper;