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Pierluigi Mansueto

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Gender: Male **Date of birth:** 18/10/1995 **Nationality:** Italian

ABOUT MYSELF

I am a Post-Doc Researcher specializing in Operations Research and Machine Learning. My primary research interests include Multi-Objective Optimization, Clustering, Bayesian Optimization and Global Optimization. I am deeply passionate about my work and driven by a strong curiosity to explore the unknown. I continuously strive to expand my knowledge and learn as much as possible.

WORK EXPERIENCE

Department of Information Engineering, University of Florence

City: Florence | **Country:** Italy

[11/2023 – Current] **Postdoctoral Research Fellow**

Research project title: Advanced Methods for Multi-Objective Optimization.

Main topics: Gradient-based Descent Methodologies, Bayesian Optimization.

Other activities: Teaching, Research on the main Operations Research and Machine Learning topics.

Department of Information Engineering, University of Florence - Yanmar Italia

City: Florence | **Country:** Italy

[06/2020 – 11/2020] **Machine Learning Engineer - Term Contract**

Research project name: Machine Learning Methods for Anomaly Detection from Sensor Data.

Target: Automatic detection of anomalies of mechanical devices based on signals from sensors.

Tools: Traditional Signal Analysis Techniques, Machine Learning Methods.

EDUCATION AND TRAINING

[11/2020 – 10/2023] **PhD in Information Engineering**

Department of Information Engineering, University of Florence https://informationengineering.dinfo.unifi.it/

City: Florence | **Country:** Italy | | **Final grade:** Excellent cum laude | **Thesis:** Pareto Front Reconstruction of Multi-Objective Optimization Problems

Curriculum: Control, Optimization and Complex Systems

Tutors: Prof. Schoen Fabio, Prof. Sciandrone Marco

Main Research Topics: Constrained, Sparse, Large Scale, Multi-Objective Optimization; Clustering Problems; Mixed-Integer Optimization; Bayesian/Black-Box Optimization; Machine Learning

Main Courses: Optimization Algorithms in Machine Learning; Probabilistic Graphical Models; Linear and nonlinear Kalman filtering: theory and applications; Computer Vision and Deep Learning in Practice; Memory Networks; Explainable Artificial Intelligence; Geometric Deep Learning; Artificial Intelligence Solutions for Time Series Analysis and Natural Language Processing; Parallel Computing Fundamentals

PhD Schools: EUROPT Summer School 2022, Lisbon, 2022; OBA Summer School "Optimization, Big Data and Applications", Veroli, 2022; PhD EUROPT Summer School: the need, the challenge and the success of robust and nonsmooth optimization, Virtual, 2021; PhD AIRO Winter School, Virtual, 2021

[09/2017 – 02/2020] **Master's Degree in Computer Engineering**

School of Engineering, University of Florence https://www.ingegneria.unifi.it/

City: Florence | **Country:** Italy | | **Final grade:** 110/110 summa cum laude and solemn commendation | **Thesis:** Clustering algorithms based on the Memetic Differential Evolution method (Supervisors: Prof. Schoen Fabio, Prof. Sciandrone Marco)

Programming Languages: Python, Scripting Bash, C++, Matlab, Javascript, Typescript, HTML5, CSS, Java, C; Algorithm Implementation & Optimization; Machine Learning; Human Computer Interaction; Software Design; Software Development; Image and Video Analysis

[09/2014 – 09/2017] **Bachelor's Degree in Computer Engineering**

School of Engineering, University of Florence https://www.ingegneria.unifi.it/

City: Florence | **Country:** Italy | | **Final grade:** 110/110 summa cum laude | **Thesis:** Un algoritmo Tabu Search per la pianificazione di calendari sportivi (Supervisor: Prof. Schoen Fabio)

Programming Languages: C++, Java, C; Foundations of Computer Programming; Mathematical Analysis; Geometry and Linear Algebra; Operations Research Foundations; Artificial Intelligence; Algorithms and Data Structure; Computer Architectures; Foundations of Telecommunications and Telematics; Multimedia Design and Production

[09/2009 – 07/2014] **Secondary School Diploma - "Liceo Scientifico"**

I.S.I.S. "Benedetto Varchi" https://www.isisvarchi.edu.it/

City: Montevarchi (AR) | **Country:** Italy |

PUBLICATIONS

[2025] **On the computation of the efficient frontier in advanced sparse portfolio optimization**

Authors: A. Annunziata, M. Lapucci, P. Mansueto, D. Pucci | **Journal Name**: 4OR | **Volume, Issue and Pages**: ISSN 1614-2411 | **Publisher**: Springer

Link: https://github.com/dadoPuccio/MO-Portfolio

[2025] **Optimization-Driven Design of Monolithic Soft-Rigid Grippers**

Authors: P. Mansueto, M. Dragusanu, A. Saeed, M. Malvezzi, M. Lapucci, G. Salvietti | **Journal Name**: Soft Robotics | **Volume, Issue and Pages**: ISSN 21695172 | **Publisher**: Mary Ann Liebert, Inc.

[2025] **A Bi-Objective Optimization Based Acquisition Strategy for Batch Bayesian Global Optimization**

The implementation code of the Bi-Objective Acquisition Function Methodology for Bayesian Optimization can be found at the provided link.

Authors: F. Carciaghi, S. Magistri, P. Mansueto, F. Schoen | **Journal Name**: Computational Optimization and Applications | **Volume, Issue and Pages**: ISSN 1573-2894 | **Publisher**: Springer

Link: https://github.com/FranciC19/biobj_acquistion_function_for_BO

[2024] **Cardinality-Constrained Multi-Objective Optimization: Novel Optimality Conditions and Algorithms**

The implementation code of the MOIHT/MOHyb algorithms and the SFSD methodology can be found at the provided link.

Authors: M. Lapucci, P. Mansueto | **Journal Name**: Journal of Optimization Theory and Applications | **Volume, Issue and Pages**: Vol. 201 Issue 1, pp. 323-351, ISSN 1573-2878 | **Publisher**: Springer

Link: https://github.com/pierlumanzu/cc-moo

[2023] **Improved front steepest descent for multi-objective optimization**

The implementation code of the IFSD algorithm can be found at the provided link.

Authors: M. Lapucci, P. Mansueto | **Journal Name**: Operations Research Letters | **Volume, Issue and Pages**: Vol. 51 Issue 3, pp. 242-247, ISSN 0167-6377 | **Publisher**: Elsevier

Link: https://github.com/pierlumanzu/ifsd

[2023] **A Limited Memory Quasi-Newton Approach for Multi-Objective Optimization**

Reference: COAP Best Paper 2023

The implementation code of the tested algorithms can be found at the provided link.

Authors: M. Lapucci, P. Mansueto | **Journal Name**: Computational Optimization and Applications | **Volume, Issue and Pages**: Vol. 85 Issue 1, pp. 33-73, ISSN 1573-2894 | **Publisher**: Springer

Link: https://github.com/pierlumanzu/limited_memory_method_for_MOO

[2023] **A memetic procedure for global multi-objective optimization**

The implementation code of the NSMA algorithm can be found at the provided link.

Authors: M. Lapucci, P. Mansueto, F. Schoen | **Journal Name**: Mathematical Programming Computation | **Volume, Issue and Pages**: Vol. 15, pages 227–267, ISSN 1867-2957 | **Publisher**: Springer

Link: https://github.com/pierlumanzu/nsma

[2021] **Pareto Front Approximation through a Multi-objective Augmented Lagrangian Method**

The implementation code of the FRONT-ALAMO algorithm can be found at the provided link.

Authors: G. Cocchi, M. Lapucci, P. Mansueto | **Journal Name**: EURO Journal on Computational Optimization | **Volume, Issue and Pages**: Vol. 9, ISSN 2192-4406 | **Publisher**: Elsevier

Link: https://github.com/pierlumanzu/front-alamo

[2021] **Memetic differential evolution methods for clustering problems**

Authors: P. Mansueto, F. Schoen | **Journal Name**: Pattern Recognition | **Volume, Issue and Pages**: Vol. 114, ISSN 0031-3203 | **Publisher**: Elsevier

[2020] **Recognition of Concordances for Indexing in Digital Libraries**

Authors: S. Marinai, S. Capobianco, Z. Ziran, A. Giuntini, P. Mansueto | **Journal Name**: Book: Digital Libraries: The Era of Big Data and Data Science | **Volume, Issue and Pages**: pp. 135-147, ISBN 978-3-030-39905-4 | **Publisher**: Springer

PREPRINTS (SUBMITTED AND UNDER REVISION)

[2025] **A Nonmonotone Front Descent Method for Bound-Constrained Multi-Objective Optimization**

Author: P. Mansueto.

The arXiv preprint is available at the first link, and the implementation code for the proposed method can be found at the second link.

Links: https://arxiv.org/abs/2509.02409 | https://github.com/pierlumanzu/fpd_nmt

[2025] **Efficient globalization of heavy-ball type methods for unconstrained optimization based on curve searches**

Authors: F. Donnini, M. Lapucci, P. Mansueto.

The arXiv preprint is available at the first link, and the implementation code for the proposed method can be found at the second link.

Links: https://doi.org/10.48550/arXiv.2505.19705 | https://github.com/dfede3/cs_hb

[2025] **Projection-based curve pattern search for black-box optimization over smooth convex sets**

Authors: X. Jia, M. Lapucci, P. Mansueto.

The arXiv preprint is available at the first link, and the implementation code of the FSP method can be found at the second link.

Links: https://doi.org/10.48550/arXiv.2503.20616 | https://github.com/pierlumanzu/FSP

[2024] **Combining Gradient Information and Primitive Directions for High-Performance Mixed-Integer Optimization**

Authors: M. Lapucci, G. Liuzzi, S. Lucidi, P. Mansueto.

The arXiv preprint is available at the first link, and the implementation code of the G-DFL method can be found at the second link.

Links: https://doi.org/10.48550/arXiv.2407.14416 | https://github.com/pierlumanzu/g_dfl

[2024] **Effective Front-Descent Algorithms with Convergence Guarantees**

Authors: M. Lapucci, P. Mansueto, D. Pucci.

The arXiv preprint is available at the first link, and the implementation code of the FD framework can be found at the second link.

Links: https://doi.org/10.48550/arXiv.2405.08450 | https://github.com/pierlumanzu/fd_framework

[2024] **Memetic Differential Evolution Methods for Semi-Supervised Clustering**

Authors: P. Mansueto, F. Schoen.

The arXiv preprint is available at the first link, and the implementation code for the proposed methods can be found at the second link.

Links: https://doi.org/10.48550/arXiv.2403.04322 | https://github.com/pierlumanzu/s_mdeclust

BIBLIOMETRIC INDICATORS

[2020 – 2025] **Scopus**

- Total Number of Citations: 80
- Average Number of Citations per Publication: 8
- H-index: 5

Link: https://www.scopus.com/authid/detail.uri?authorId=57221923262

[2020 – 2025] **Scholar**

- Total Number of Citations: 129
- Average Number of Citations per Publication: 6.789
- H-index: 5

Link: https://scholar.google.com/citations?user=5dwG9b8AAAAJ&hl=it

[2020 – 2025] **Impact Factor**

- Total: 29.518
- Average per Publication: 2.952

HONOURS AND AWARDS

[22/04/2025] **EURO Doctoral Dissertation Award - Finalist Awarding institution:** EURO - Association of European Operational Research Societies

My PhD thesis was selected as one of the top 4 dissertations defended at a European university on Operations Research topics between 2024 and 2025.

Link: https://www.euro-online.org/web/pages/1745/edda-finalists-2025

[03/10/2024] **COAP Best Paper Award 2023 Awarding institution:** Editorial Board of Computational Optimization and Applications

My paper, coauthored with Matteo Lapucci and titled “A Limited Memory Quasi-Newton Approach for Multi-Objective Optimization”, was selected as the award-winning paper among the 99 papers published in Computational Optimization and Applications in 2023.

Link: https://doi.org/10.1007/s10589-024-00619-y

[31/07/2024] **AIROYoung Dissertation Award - Finalist Awarding institution:** AIRO - Italian Association of Operations Research

My PhD thesis was selected as one of the top 4 dissertations defended in Italy on Operations Research topics between July 2023 and June 2024.

[28/02/2020] **Solemn Commendation Awarding institution:** School of Engineering, University of Florence

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

CONFERENCES & SEMINARS

[07/07/2021 – 02/07/2025] **EUROPT - Conference on Advances in Continuous Optimization**

- 2025, 22nd Ed., Southampton - Invited Session, Talk: "Combining Gradient Information and Primitive Directions for High-Performance Mixed-Integer Optimization"
- 2024, 21st Ed., Lund - Contributed Session, Talk: "Memetic Differential Evolution Methods for Semi-Supervised Clustering"
- 2023, 20th Ed., Budapest - Invited Session, Talk: "Improved Front Steepest Descent for Multi-Objective Optimization"
- 2022, 19th Ed., Lisbon - Invited Session, Talk: "A Quasi-Newton Approach for Large Scale Multi-Objective Optimization"
- 2021, 18th Ed., Toulouse (Virtual) - Contributed Session, Talk: "Pareto Front Approximation through a Multi-objective Augmented Lagrangian Method"

Links: https://europt2025.org/ | https://europt2024.event.lu.se/ | http://europt.p-graph.org/ | https://sites.fct.unl.pt/europt2022/ | https://europt2021.recherche.enac.fr/

[30/06/2024 – 25/06/2025] **EURO - European Conference on Operational Research**

- 2025, 34th Ed., Leeds - Participation to the EURO Doctoral Dissertation Award Final, Talk: "Pareto Front Reconstruction of Multi-Objective Optimization Problems"
- 2024, 33rd Ed., Copenhagen - Invited Session, Talk: "A Bi-Objective Optimization Based Acquisition Strategy for Batch Bayesian Global Optimization"

Link: https://euro2025leeds.uk/

[14/09/2021 – 12/09/2024] **ODS - International Conference on Optimization and Decision Science**

- 2024, Badesi - Participation to the AIROYoung Dissertation Award Final, Talk: "Pareto Front Reconstruction of Multi-Objective Optimization Problems"
- 2023, Ischia - Invited Session, Talk: "Improved Front Steepest Descent for Multi-Objective Optimization"
- 2022, Florence - Invited Session, Talk: "A Quasi-Newton Approach for Large Scale Multi-Objective Optimization"
- 2021, Rome - Contributed Session, Talk: "Improving the NSGA-II Algorithm with Descent Steps"

Links: https://www.airoconference.it/ods2024/ | https://www.airoconference.it/ods2023/ | https://www.airoconference.it/ods2022/ | https://www.airoconference.it/ods2021/

[14/09/2023] **RAMOO - Workshop on Recent Advances in Multi-Objective Optimization**

- 2023, 10th Ed., Rome - Invited Session, Talk: "Improved Front Steepest Descent for Multi-objective Optimization"

Link: https://moo.univie.ac.at/previous-workshops/ramoo-2023/

[31/05/2023 – 03/06/2023] **SIAM Conference on Optimization**

- 2023, Seattle - Invited Session, Talk: "Novel Approaches for Multi-Objective Cardinality-Constrained Optimization Problems"

Link: https://www.siam.org/conferences-events/past-event-archive/op23/

TEACHING ACTIVITIES

[03/2025 – Current] **2nd Level Master Course "Optimization for machine learning"**

8 hours / 1 CFU.

2nd Level Master in Data Science and Statistical Learning (MD2SL), University of Florence.

Link: https://www.md2sl.unifi.it/

[04/2024 – 02/2025] **PhD Courses**

- 2024 - "Continuous Multi-Objective Optimization", 12 hours / 3 CFUs, PhD program in Information Engineering, University of Florence
- 2025 - "Old and New Algorithms for Clustering Problems", 8 hours / 2 CFUs, PhD program in Information Engineering, University of Florence

Link: https://informationengineering.dinfo.unifi.it/

[06/2021 – 05/2025] **Tutoring and Integrative Teaching**

Optimization and Data Science for Management (Course in Management Engineering, University of Florence)

- 2025 - Hours: 8 tutoring
- 2024 - Hours: 3 tutoring and 3 integrative teaching
- 2023 - Hours: 3 tutoring
- 2022 - Hours: 3 tutoring
- 2021 - Hours: 10 tutoring and 3 integrative teaching

Optimization Techniques for Machine Learning (Course in Computer Engineering, University of Florence)

- 2023 - 5 hours of seminars

THESIS ADVISOR

[09/2023 – 04/2024] **Master's Thesis in Artificial Intelligence**

Title: "A memetic algorithm for constrained clustering" - University of Florence.

[05/2022 – 11/2022] **Master's Thesis in Computer Engineering**

Title: "Advanced memetic algorithms for clustering problems" - University of Florence.

ORGANIZATION ACTIVITIES

[29/06/2025 – 02/07/2025] **EUROPT - Conference on Advances in Continuous Optimization**

- 2025, 22nd Ed., Southampton - 2 Invited Sessions on "Continuous Multi-Objective Optimization: Algorithms and Complexity Analyses" and "Global Multi-Objective Optimization"

[30/08/2022 – 06/09/2023] **ODS - International Conference on Optimization and Decision Science**

- 2023, Ischia - Invited Session on "Recent Advances in Multiobjective Optimization"
- 2022, Florence - Invited Session on "Advances in Multiobjective Optimization"

EDITORIAL ACTIVITIES

[04/2022 – Current] **Reviewer**

- Optimization Methods and Software: 6 revisions.
- Journal of Global Optimization: 4 revisions.
- Transactions in Operations Research: 3 revisions.
- Computational Optimization and Applications: 3 revisions.
- Numerical Algorithms: 3 revisions.
- Operations Research Letters: 3 revisions.
- INFORMS Journal on Computing: 2 revisions.
- A Quarterly Journal of Operations Research: 2 revisions.
- SIAM Journal on Optimization: 1 revision.

- Mathematical Programming: 1 revision.
- Computational and Applied Mathematics: 1 revision.
- The Journal of Supercomputing: 1 revision.
- RAIRO - Operations Research: 1 revision.

MAIN INTERESTS AND SKILLS

Main Professional Interests

Operations Research: Multi-Objective Optimization; Continuous and Mixed-Integer Optimization; Constrained and Non-Linear Optimization; Sparse Optimization; Large-Scale Optimization; Bayesian/Black-Box Optimization; Applications to Machine Learning

Machine Learning: Clustering; Anomaly Detection; Signal and Image Processing; Logistic Regression; Deep Learning

Technological Skills

Programming Languages: Python, Scripting Bash, C++, Matlab, Javascript, Typescript, HTML5, CSS, Java, C

Tools: Latex, Git, Microsoft Office, Angular, Tensorflow, Gurobi, COIN-OR, CUTEst, Botorch, PyTorch, Bootstrap, StarUML

Operating Systems: Linux, Ubuntu, Windows, MacOS

Social Skills

I am enthusiastic about working in a team environment. I strive to collaborate effectively with colleagues to accomplish tasks and support them when challenges arise. I am also confident in making decisions related to project development and team growth.

Organizational Skills

I am capable of working independently and with flexibility. I have strong planning skills that help me achieve set goals efficiently.

Job-related Skills

I pay close attention to detail and handle pressure and tight deadlines well. I make it a priority to learn as much as possible and solve problems in the most efficient and effective way. I see myself as a self-confident individual with an entrepreneurial spirit.

CERTIFICATIONS

[02/2022] **Professional Engineering Licence (Italian Legislation)**

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING B2 **READING** B2 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user

DRIVING LICENCE

Cars: B

HOBBIES AND INTERESTS

Blog Writer on Artificial Intelligence Topics (2025 - Current)

Link: https://sportellodeicittadini.it/

Returning Officer (2022 - Current), Terranuova Bracciolini (AR), Italy

Football (2015 - Current)