Gabriele IOMMAZZO | PhD candidate

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LOOKING FOR A POSTDOC/RESEARCHER POSITION
IN MACHINE LEARNING AND/OR MATHEMATICAL OPTIMIZATION

Work Experience

Ph. D. in Algorithm Configuration, Surrogate-Based Optimization, Distance Geometry
Jointly: CNRS LIX, École Polytechnique, France & Università di Pisa, Italy *Oct 2017–Dec 2021*

- Designed methodologies for the **Algorithm Configuration Problem** (find the best parameters for running an algorithm on specific inputs), combining Mathematical Programming (MP) and Machine Learning/Deep Learning (ML/DL); studied their application to the solution of optimization problems in the energy field; implemented computational pipeline for testing them. The Algorithm Configuration Problem is related to, e.g., meta-learning and AutoML
- Explored the computational challenges of optimizing **MP formulations of trained ML/DL predictors** (decision trees, support vector and logistic regression, neural networks)
- Tested MP formulations for **Distance Geometry**
- Presented at international conferences
- visiting researcher: Operations Research Group, Università di Pisa, Italy (Sep 2018–Jan 2019, Sep 2019–Feb 2019, Sep 2019–May 2020); CERC in Data Science for Real-Time Decision-Making, Polytechnique Montréal, Canada (Oct 2019).

Teaching Assistant
École Polytechnique, France *Apr 2018–Jun 2018*
"Traitement de données massives" (INF442). Topics: C++, high performance computing (MPI protocol), big data. Duties: assisted students with understanding algorithms and debugging code during practical laboratory sessions

Research Intern
CNRS LIX, École Polytechnique, France *May 2017–Oct 2017*
Automatic configuration of optimization solvers: developed an approach to tune the IBM ILOG CPLEX optimization solver, combining Support Vector Regression and Nonlinear Optimization techniques.

Associazione Italiana Arbitri (AIA-FIGC) **Seziona AIA "Roma 2", Roma, Italy**
Soccer Referee (5-a-Side) *Aug 2012–Mar 2013*

Education and Training

M. Sc. in Business Informatics and Data Science (110/110 cum laude)
Università di Pisa, Dipartimento di Informatica, Italy *Oct 2013–Oct 2017*

Main topics: theory, solution techniques and computational approaches of Mathematical Optimization, Machine Learning and Data Mining, Numerical Analysis, Algorithms and Data Structures, Programming Languages, Databases and Data Warehouses.
During this period, I spent about 1.5 years taking courses (undergraduate and graduate) in mathematics and computer science outside the M. Sc. curriculum, which were not offered in my B. Sc.

Thesis: *Combining Machine Learning and Mathematical Optimization techniques to tackle IBM ILOG CPLEX automatic configuration on Hydro Unit Commitment problems*

Erasmus Student Exchange Program
Universidad de Zaragoza, Facultad de Economía y Empresa, Spain *Sep 2011–Mar 2012*

B.Sc. in Business Administration and Management (104/110)
Università di Roma Tor Vergata, Departimento di Economia, Italy *Oct 2008–Apr 2013*
Main topics: Statistics, Financial Mathematics, Business Economics, Financial Accounting

Computer Science skills

Coding: **AMPL**, C++, Matlab, **Python**, SQL

Software: optimization solvers (IBM ILOG CPLEX, Baron, Bonmin), platforms (Azure, KNIME), deep learning (PyTorch)

Deployment: Git, Jupyter

Typesetting: LaTeX, Microsoft Office

Languages

Italian (mothertongue), **English** (proficient, IELTS 7.5/9), **French** (proficient), Spanish (elementary)

Publications

Conference proceedings

L. Liberti, G. Iommazzo, C. Lavor and N. Maculan (2021), *A Cycle-based Formulation for the Distance Geometry Problem*. In C. Gentile et al. (Eds.), Graphs and Combinatorial Optimization: from Theory to Applications (CTW2020), AIRO Springer Series, 5:93–106, Springer, Cham.

G. Iommazzo and C. D'Ambrosio and A. Frangioni and L. Liberti (2020), *A Learning-based Mathematical Programming Formulation for the Automatic Configuration of Optimization solvers*. In G. Nicosia et al. (Eds.), Machine Learning, Optimization, and Data Science (LOD2020), Lecture Notes in Computer Science, 12565:700–712, Springer Cham.

G. Iommazzo, C. D'Ambrosio, A. Frangioni, L. Liberti (2020), *Learning to Configure Mathematical Programming Solvers by Mathematical Programming*. In P. Pardalos, M. Brunato (Eds.), Learning and Intelligent Optimization (LION14), Lecture Notes in Computer Science, 12096:377–389, Springer Cham., 2020.

Book chapters

G. Iommazzo, C. D'Ambrosio, A. Frangioni, L. Liberti, *The Algorithm Configuration Problem*, to appear in the 3rd edition of the Encyclopedia of Optimization, Springer Nature.

International journals

L. Liberti, G. Iommazzo, C. Lavor, N. Maculan, *Cycle-based Formulations in Distance Geometry*, submitted to Open Journal of Mathematical Optimization.

PhD Thesis

G. Iommazzo, *Algorithmic Configuration by Learning and Optimization*.

In preparation

G. Iommazzo, Claudia D'Ambrosio, Antonio Frangioni, Leo Liberti *Optimization over Trained Machine Learning Predictors for Parameter Tuning*

Professional service

Program committee member: The 15th Learning and Intelligent Optimization Conference (LION15)

Reviewer: produced reviews for Learning and Intelligent Optimization (LION), Journal of Global Optimization (JoGO)

Awards

1-year Research Grant: "Machine Learning Based Approaches for the Algorithm Configuration Problem", Department of Computer Science, Università di Pisa, Italy. Amount: € 20.354

Other

Interests: Climbing, boardgames, second-hand book shops

Classical Music: 5th-year Piano Diploma, Conservatorio di Roma S. Cecilia, Roma, Italy (2006)

Extracurricular activities: Children's activity leader, Oratorio Salesian Don Bosco Cinecittà, Roma, Italy (2003–2010)

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