Fabrizio Marinelli

Curriculum Vitae et Studiorum

Personal details

Birth	Pescara, Italy, December 14, 1968
Nationality	Italian
Position	Full Professor of Operations Research (MAT/09)
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General information

Fabrizio Marinelli was born on December 14th, 1968 in Pescara, Italy.

He obtained a MSc in Computer Science from the University of L'Aquila (I) in 1997, and a PhD in Operations Research from the University of Rome "Sapienza" in 2002.

In the last years of graduate studies and during the PhD (from 1995 to 2002), he was also employed as senior software developer (as researcher since 1998) at TAIProra s.r.l. where he developed various industrial projects involving discrete optimization.

After five years of post-doctoral fellowships in Operations Research (four years of which were spent at University of L'Aquila and one at the LIX Lab of the École Polytechnique in Palaiseau, France) in 2007 he got a permanent position as a researcher at the DII-UNIVPM, where he is presently affiliated.

In 2008, he obtained the French scientific qualification as *maêtre de conférence* in Applied Mathematics. He also obtained the Italian scientific qualifications as full professor in Operations Research (2017) and in Information Processing Systems (2022).

From 2016 to 2023, Fabrizio Marinelli was an associate professor in Operations Research at the DII-UNIVPM. At present he holds the position of full professor at the same department.

Research

Areas of competence (ACM CCS 2012)

- Applied Computing • Operations Research
- Math of computing • Discrete math • Graph theory • Graph algorithms
- Math of computing • Discrete math • Combinatorics • Combinatorial optimization

Fabrizio Marinelli works with national and international research groups on topics that mainly include discrete optimization, with particular attention to cutting and packing problems. Over the years, he has promoted scientific collaborations by establishing cross-domain collaborations with researchers from UNIVPM and other Universities, including Università degli Studi dell'Aquila (IT), Università degli studi del Sannio (IT), Università degli Studi di Napoli Federico II (IT), Politecnico di Milano (IT), Istituto di Analisi Sistemi ed Informatica IASI-CNR (IT), University of Graz (AT), Bilkent University (TR), Universidade do Minho (PT), École Polytechnique (FR), Chalmers University (SE) and Tampere University (FI).

In 2011 and 2022, he was invited as Senior Researcher at the LIX (Laboratoire d'Informatique) - École Polytechnique, Palaiseau (F) where he conducted research on worst-case and approximation analysis of algorithms by mathematical programming.

He is a regular member of national and international societies and working groups, including MIPS - Mixed-Integer Programming Society - a section of the Mathematical Optimization Society, SIAM - Society for Industrial and Applied Mathematics, SIMAI - Italian Society of Applied and Industrial Math, INFORMS - The Institute for Operations Research and the Management Sciences, ESICUP - Working Group on Cutting and Packing within EURO - the Association of the European Operational Research Societies, and AIRO - Italian Society of Operations Research.

In the last twenty years, Fabrizio Marinelli has regularly served as reviewer for over 25 international journals. He has been recognized as an Outstanding Reviewer for the European Journal of Operational Research and the Int. J. of Production Economics, and a Recognized Reviewer for Applied Math and Computation, Computer communications, Computers & Industrial Engineering, Computers & Operations Research, Discrete Applied Mathematics, and Omega - the International Journal of Management Science.

He was co-chair of the AIRO2002 conference, and a member of the organizing committee of the 5th ESICUP Meeting. He was the organizer and chair of the invited sessions *MILP in Manufacturing and Logistics* at 31th and 32th European Conference on Operational Research. Currently and since 2017, he is a member of the program committee of ICORES conferences.

Fabrizio Marinelli co-authored 30 papers published in international journals, 31 book chapters and conference proceedings, 60 short or extended abstracts presented in international conferences, and a few dissemination articles. His paper collected 800 citations overall, and his H-index is 14 (Scopus source).

His main research interest focuses on **discrete optimization, with particular emphasis on methodological and algorithmic aspects of decision problems arising in industrial contexts**. In fact, most of the scientific production of Fabrizio Marinelli is **constantly focused on problems that arise from real applications**, in the attempt to combine the methodological accuracy of the discipline with the complexity of real cases. Besides some relevant theoretical and methodological results, indeed, many works of Fabrizio Marinelli deal with, or were inspired by, decision problems

arising in real manufacturing and logistics settings. Such problems are mainly addressed by integer linear program decomposition and reformulation techniques, and by designing heuristic approaches and exact algorithms.The proposed algorithms, most of which are based on Integer Linear Programming (ILP), tackle the problems from both the primal (feasible solution) and the dual (lower/upper bound) side, and their design took advantage of a variety of mathematical techniques ranging from polyhedral decomposition to dynamic column generation, from strategies for variable fixing to dual bound tightening, from branching rule design to symmetry handling.

The scientific production of Fabrizio Marinelli mainly lies in the classic, but still very active, research stream of *Cutting & Packing* problems, and concerned, in particular, the development of models and algorithms to integrate cut optimization and operational and/or tactical production planning decisions. However, there are also applications of mathematical programming and advanced optimization algorithms to other less traditional domains such as energy systems management and software engineering.

Teaching

Fabrizio Marinelli carries out teaching activities since 1998. He gave more than 48 graduate, post-graduate and PhD courses in Operations Research and Algorithms.

From 1998 to 2006, during his PhD and the later periods as post-doctoral fellow, he was the teacher of some post-graduate courses on Algorithms and C Language, and he gave graduate courses in Operations Research at the University of L'Aquila and at the UNIVPM.

After a short course on C++ at the LIX lab of École Polytechnique (F), in 2007 he started teaching at the UNIVPM. In the years since 2007, Fabrizio Marinelli gave on average 2.62 courses on Operation Research topics per year. Over the years, he taught in Software and Automation Engineering BSc and MSc, Management Engineering BSc and MSc, Bio Engineering BSc, Industrial Production Engineering BSc, and Information Engineering PhD school. In the current academic year, he is the teacher of four courses on Operations Research and Mathematical Programming.

Regularly since 2009, Fabrizio Marinelli is a board member of the PhD school in Information Engineering at UNIVPM. He gives a PhD course on *Mathematical Programming and Graph Theory* since 2017. He has also been invited to deliver two short PhD courses in the Summer School "Operations Research days at Cadore", a PhD course entitled *Models and algorithms for 1-dimensional cutting problems* at University of Tor Vergata (IT), and a PhD course entitled *Mathematical programming and graphs* at Tampere University (FI).

Since 2024, Fabrizio Marinelli has been a member of the Advisory Board of the PhD school ISGE - Ilmenau School of Green Electronics, Technische Universität, Ilmenau (Germany).

Over the years Fabrizio Marinelli has been the (co)-advisor of (one) two PhD fellowships, and the scientific supervisor of two biennial postDoc fellowships.

In the last twenty years, he has been the advisor of about 50 MSc/BSc thesis, mainly on optimisation and simulation, at the UNIVPM and at the University of L'Aquila.

Academic appointments and responsibilities

Fabrizio Marinelli has been in charge, as scientific coordinator, of six industrial contracts between the DII and business partners, two of which before 2018.

In the same years, Fabrizio Marinelli was the promoter, and the representative, of a bilateral agreements with the Graduate School of Informatics, Nagoya University, with CNR "Mauro Picone" Institute, and with the Centre of Excellence DEWS of the University of L'Aquila.

On the funding side, Fabrizio Marinelli has been in the advisory board of the EC Cooperative Research Project CT-2006-032998 funded by the VI European Framework Programme. He has been a member, also in the role of research unit scientific coordinator, of three Italian projects sponsored by the Education and Research Ministry. He also took part in three local scientific projects funded by the UNIVPM.

Industrial research and knowledge transfer

Fabrizio Marinelli promotes relationships with businesses and has established close collaborations with important multinational companies and firms operating in Italy. Specifically, since 1998 he actively contributed to the technological transfer of techniques and methodologies of discrete optimization, with the role of scientific advisor, project coordinator, and senior software designer in more than 15 industrial projects involving leading companies such as Schnell Group (`www.schnell.it`), Luxottica Group (`www.luxottica.com`), SCM Group (`www.scmgroup.com`), Micron Semiconductor Italia (`www.micron.com`), Hydro Alluminium (`www.hydro.com`), Pilkington (`www.pilkington.com`), Hay Group (`www.haygroup.com`), and Dayco Europe (`www.dayco.com`).

Publications (only articles in International Journals)

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[J4] C Arbib, F Marinelli, M Pinar, and A Pizzuti. Robust stock assortment and cutting under defects in automotive glass production. *Production and Operations Management*, 31(11):4154–4172, 2022.

[J5] F Marinelli, A Pizzuti, and F Rossi. LP-based dual bounds for the maximum quasi-clique problem. *Discrete Applied Mathematics*, (296):118–140, 2021.

[J6] C Arbib, F Marinelli, and A Pizzuti. Number of bins and maximum lateness minimization in two-dimensional bin packing. *European Journal of Operational Research*, 1(291):101–113, 2021.

[J7] E Frontoni, F Marinelli, R Rosetti, and P Zingaretti. Optimal stock control and procurement by reusing of obsolescences in manufacturing. *Computers & Industrial Engineering*, (148):106697, 2020.

[J8] F Marinelli and A Pizzuti. A Sequential Value Correction heuristic for a bi-objective two-dimensional bin-packing. *Electronic Notes in Discrete Mathematics*, (64):25–34, 2018.

[J9] E Frontoni, F Marinelli, R Rosetti, and P Zingaretti. Shelf space re-allocation for out of stock reduction. *Computers & Industrial Engineering*, (106):32–40, 2017.

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[J14] L Liberti and F Marinelli. Mathematical programming: Turing completeness and applications to software analysis. *Journal of Combinatorial Optimization*, 1(28):82–104, 2014.

[J15] C Arbib and F Marinelli. On Cutting Stock with Due Dates. *Omega*, (46):11–20, 2014.

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[J17] F Marinelli, S Nocella, F Rossi, and S Smriglio. A Lagrangian Heuristic for Satellite Range Scheduling with Resourse Constraints. *Computers & Operations Research*, (38):1572–1583, 2011.

[J18] A Aloisio, C Arbib, and F Marinelli. Cutting Stock with No Three Parts per Pattern: Work-in-process and Pattern Minimization. *Discrete Optimization*, (8):315–332, 2011.

[J19] A Aloisio, C Arbib, and F Marinelli. On LP Relaxations for the Pattern Minimization Problem. *Networks*, 3(57):247–253, 2011.

[J20] L Liberti, S Le Roux, J Leconte, and F Marinelli. Mathematical programming based debugging. *Electronic Notes in Discrete Mathematics*, 1(36):1311–1318, 2010.

[J21] E Goubault, S Le Roux, J Leconte, L Liberti, and F Marinelli. Static Analysis by Abstract Interpretation: a Mathematical Programming Approach. *Electronic Notes in Theoretical Computer Science*, 1(267):73–87, 2010.

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[J25] V Cortellessa, F Marinelli, and P Potena. An Optimization Framework for "Build-or-Buy" Decisions in Software Architecture. *Computers & Operations Research*, 10(35):3090–3106, 2008.

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[J28] C Arbib and F Marinelli. Integrating Process Optimization and Inventory Planning in Cutting-Stock with Skiving Option: an Optimization Model and its Application. *European Journal of Operational Research*, 3(163):617–630, 2005.

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