Marco Ghirardi

Short CV

Current Professional Appoitment:

- Assistant Professor in the "Automation" (ING-INF/04) scientific-disciplinary sector.

  Department of Management and Production Engineering
  Politecnico di Torino
  C.so Duca degli Abruzzi, 24
  10129 - Torino,
  ITALY

Education and Qualifications

- Computer Science Engineering Degree at the "Politecnico di Torino" in July 1999 (107/110). Master Thesis title: "Lagrangean Relaxation Techniques for the two-machine Flow Shop scheduling problem", D.A.I. Politecnico di Torino.
- PhD in "Computer Science Engineering" at the "Politecnico di Torino". PhD Thesis title: "Recovering Beam Search: a hybrid heuristic framework for Combinatorial Optimisation Problems", D.A.I., 2003.

Main Research and Teaching activities abroad

- Southampton University. Faculty of Maths (UK) under the supervision of prof. C.N. Potts, from April to August 2002.
- Visiting Professor at the San Francisco State University (USA), May-August 2011.
- Professor at the TTPU Turin Polytechnic of Tashkent, Uzbekistan, 2016.
- Invited professor at the RMIT University, Melbourne, Australia. August 2018 and August 2019.

Previous Professional Career

- Winner of a Post-Doc research grant in the Automation field at the "Politecnico di Torino – Dipartimento di Automatica ed Informatica" from November 2002 to December 2003.
- Assistant Professor ("Ricercatore") in the Automation field at the "Politecnico di Torino – at "Dipartimento di Automatica ed Informatica" from 2004 to 2016.

Current Teaching Activities (academic year 2022-23)

- Master degree Course "Software Architecture for Automation" - Politecnico di Torino.
- Bachelor degree Course, "Optimization for Problem Solving" – Politecnico di Torino.
- Bachelor degree Course, "Laboratory of automation" – Politecnico di Torino.

Foreign Languages

- Native language: Italian.
- English: Very good level, written and spoken.

Scientific and Industrial Activities

Main research areas

- Combinatorial Optimization and Operations Research, especially in relation with: Production Planning, Lot Sizing Problems, Scheduling problems, Location problems, Planning Techniques.
- Algorithms and methods for automated guided vehicles routing optimization.
- Design of exact algorithms for combinatorial optimization problems.
- Design of heuristics, meta-heuristics, mat-heuristics for combinatorial optimization problems.
- Discrete Event Dynamic Systems and Simulation, especially in relation with analysis and optimisation of production lines by hybrid simulation models.
- Distributed and collaborative scheduling algorithms.
- Robotics, in particular models and algorithms for controlling the walk of biped robots.
- Supply chain management, logistics and transportation planning.

Main industrial projects

- PIRELLI Next-MIRS – development of the production scheduler for the production site in Settimo Torinese (TO).
- ELETTRIC80 – Realization of an automated algorithm for the optimized routing of Automated Guided Vehicles (AGVs) in large warehouses.
- TELECOM ITALIA – Algorithms for Vehicle Routing and Shared Taxi Planning.

Patents

2016 Olmi R.; Di Terlizzi D.; Dabbene F.; Della Croce F.; Ghirardi M.; Sacco N. WO2015011661 - Device and Method for Optimising the Movement of Automated-Guided-Vehicles, and the like.

International journals contributions

2022 A simple and effective algorithm for the maximum happy vertices problem / Ghirardi, Marco; Salassa, Fabio. - In: TOP. - ISSN 1134-5764. - ELETTRONICO. - 30:(2022), pp. 181-193.

2022 Improved solution of the Budget constrained Fuel Treatment Scheduling problem and extensions / Della Croce, Federico; Ghirardi, Marco; Scatamacchia, Rosario. - In: COMPUTERS & INDUSTRIAL ENGINEERING. - ISSN 0360-8352. - ELETTRONICO. - 168:(2022).

2020 Robust dynamic traffic assignment for single destination networks under demand and capacity uncertainty / Calafiore, Giuseppe C.; Ghirardi, Marco; Rizzo,

Alessandro. - In: JOURNAL OF INTELLIGENT TRANSPORTATION SYSTEMS. - ISSN 1547-2450. - 24:4(2020), pp. 331-351.

2019 Matheuristics for the lot sizing problem with back-ordering, setup carry-overs, and non-identical machines / Ghirardi, Marco; Amerio, Andrea. - In: COMPUTERS & INDUSTRIAL ENGINEERING. - ISSN 0360-8352. - 127:(2019), pp. 822-831.

2019 Estimation and Closed-Loop Control of COG/ZMP in Biped Devices Blending CoP Measures and Kinematic Information / Menga, Giuseppe; Ghirardi, Marco. - In: ROBOTICS. - ISSN 2218-6581. - 8:4(2019), p. 89.

2019 A Distributed IoT Infrastructure to Test and Deploy Real-Time Demand Response in Smart Grids / Barbierato, Luca; Estebsari, Abouzar; Pons, Enrico; Pau, Marco; Salassa, FABIO GUIDO MARIO; Ghirardi, Marco; Patti, Edoardo. - In: IEEE INTERNET OF THINGS JOURNAL. - ISSN 2327-4662. - STAMPA. - 6:1(2019), pp. 1136-1146.

2018 Lower Limb Exoskeleton for Rehabilitation with Improved Postural Equilibrium / Menga, Giuseppe; Ghirardi, Marco. - In: ROBOTICS. - ISSN 2218-6581. - 7:2(2018), p. 28

2016 Modelling, Simulation and Control of the Walking of Biped Robotic Devices—Part I : Modelling and Simulation Using Autolev / Menga, Giuseppe; Ghirardi, Marco. - In: INVENTIONS. - ISSN 2411-5134. - 1:1(2016), p. 6.

2016 Modeling, Simulation and Control of the Walking of Biped Robotic Devices—Part III: Turning while Walking / Menga, Giuseppe; Ghirardi, Marco. - In: INVENTIONS. - ISSN 2411-5134. - 1:1(2016), p. 8.

2016 Modeling, Simulation and Control of the Walking of Biped Robotic Devices, Part II: Rectilinear Walking / Menga, Giuseppe; Ghirardi, Marco. - In: INVENTIONS. - ISSN 2411-5134. - 1:1(2016), p. 7.

2015 REZAZADEGAN F., GENG J, GHIRARDI M., MURE' S., CAMUNCOLI G., DEMICHELA M., Risked-based design for the physical human-robot interaction (pHRI): An overview. DOI:10.3303/CET1543209. pp.1249-1254. In CHEMICAL ENGINEERING TRANSACTIONS - ISSN:2283-9216 vol. 43

2015 PERBOLI G., GHIRARDI M., GOBBATO L., PERFETTI F., Flights and their economic impact on the airport catchment area: an application to the Italian tourist market. DOI:10.1007/s10957-014-0613-8. pp.1109-1133. In JOURNAL OF OPTIMIZATION THEORY AND APPLICATIONS - ISSN:0022-3239, vol. 164

2012 BALDI M. M., GHIRARDI M., PERBOLI G., TADEI R. , The capacitated transshipment location problem under uncertainty: a computational study, PROCEDIA: SOCIAL & BEHAVIORAL SCIENCES, ELSEVIER, pp. 13, 2012, Vol. 39, ISSN: 1877-0428, DOI: 10.1016/j.sbspro.2012.03.119

2011 BOLLAPRAGADA R., DELLA CROCE F., GHIRARDI M., Discrete-Time, Economic Lot Scheduling Problem on Multiple, Non-Identical Production Lines, EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, pp. 8, 2011, Vol. 215, ISSN: 0377-2217, DOI: 10.1016/j.ejor.2011.05.053

2008 GHIRARDI M.; MENGA G; SACCO N, An optimisation-oriented model of distributed supply-chain, MATHEMATICS AND COMPUTERS IN SIMULATION, pp. 10, 2008, Vol. 79, ISSN: 0378-4754, DOI: 10.1016/j.matcom.2008.02.005

2005 GHIRARDI M.; C. N. POTTS, Makespan minimization for scheduling unrelated parallel machines: A recovering beam search approach, EUROPEAN JOURNAL OF OPERATIONAL RESEARCH, Elsevier, pp. 11, 2005, Vol. 165, ISSN: 0377-2217, DOI: 10.1016/j.ejor.2004.04.015

2004 G. CARELLO; DELLA CROCE DI DOJOLA F.; M. GHIRARDI; R. TADEI, Solving the hub location problem in telecommunication network design: a local search approach, NETWORKS, pp. 12, 2004, Vol. 44, ISSN: 0028-3045, DOI: 10.1002/net.20020

2004 DELLA CROCE DI DOJOLA F.; M. GHIRARDI; R. TADEI, Recovering Beam Search: enhancing the beam search approach for combinatorial optimization problems, JOURNAL OF HEURISTICS, pp. 16, 2004, Vol. 10, ISSN: 1381-1231, DOI: 10.1023/B:HEUR.0000019987.10818.e0