

ROBERTO CORDONE
CURRICULUM VITÆ ET STUDIORUM

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- SHORT BIO -

Academic positions and habilitations

May 2019 national academic *qualification as full professor* in Computer Science
November 2017 national academic *qualification as full professor* in Operations Research
May 2017 *associate professor* in Computer Science at the University of Milan
November 2013 national academic *qualification as associate professor* in Computer Science
August 2013 national academic *qualification as associate professor* in Operations Research
December 2002 *assistant professor* in Computer Science at the University of Milan

Professional activities

2003-2005 *CEO* of Crema Ricerche OptiSoft S.r.l, cooperative providing training, consulting services and software for optimization
2001-2002 *research associate* at the Politecnico of Milan
2000-2001 *researcher* at the Poliedra Consortium of the Politecnico of Milan
1996-1997 *researcher* at the MIP Graduate School of Management of the Politecnico of Milan

Education

- 2000** *Ph. D.* in Computer and Control Science at the Politecnico of Milan
- 1996** *Electronic Engineering Degree* with a specialization in Automation at the Politecnico of Milan

- GRANTS AND APPLIED PROJECTS -

- *Centro Operativo Dimessi Covid-19 (COD-19)* (2020): Organization of a telemedicine system for home care of Covid patients, prediction of the health-care demand and optimal allocation of resources (*Regione Lombardia*, Line “Industrial research and experimental development”)
- *Advanced Cosmetic Manufacturing (AD-COM)* (2016/20): Optimization of the productive process in cosmetics, with high efficiency and traceability along the production chain (*Regione Lombardia*, Line “Agreements for research and innovation”)
- *SPACE - IoT* (2017/18): “Models and algorithms for the optimization of an advanced manufacturing system for the adaptive and interactive production of architectural windows and doors” (*Regione Lombardia* Line “R&D per Aggregations 2016”)
- *FFABR* (2017): basic research activities (*Italian Ministry of Education, University and Research*)
- *Progetto T-NOVA* (2014): Network Functions as-a-Service over Virtualised Infrastructures (European project FP7-ICT-2013-11, project number 619520: Future Networks)
- *Progetto Viamente* (2012): Simulation, optimization and evaluation of a planning system for mobile workforce management (*Viamente S.r.l.*)
- *Progetto DECEMbRIA - DECisioni in EMergenza SanitaRIA* (2008/09): Decision support system for the operation center of the Emergency Management System 118 of Milan (*Regione Lombardia* and “*Cá Granda*” *Main Hospital of Milano-Niguarda*)
- *Progetto Reply* (2008): Optimization models and algorithms for banking applications (*Technology Reply S.r.l.*)
- *Progetto Tahiti* (2008): Shift optimization of a multi-skill call center (*Studio Zeta S.r.l.*)
- Bando *PRIN-COFIN 2008* n.20088SBBH9 “Models and algorithms for combinatorial optimization problems in the management of transportation systems” (*Italian Ministry of Research*)
- Bando *PRIN-COFIN 2005* n.2005099974 “Routing and packing problems in the optimization of transportation systems” (*Italian Ministry of Research*)
- *Progetto Alcatel* (2001/2002): Optimization algorithms for telecommunication network routing and design (*Alcatel Italy*)
- *Progetto Formambiente* (2001): On-line courses on sustainable mobility (supported by (*Italian Ministry of Environment*))
- *Progetto DREAMS* (2001): Development and simulation on real-world data of *Dial-a-Ride* systems (*Municipality of Milan* and *Italian Ministry of Environment*)
- *Progetto MTV* (2000): Environmental Impact Assessment of a new tram-way line in Como (*Poliedra Consortium*)
- *Progetto Volendo.com* (2000): Implementation of a routing algorithm for an online food delivery service (*NUS S.r.l.*)

- SCIENTIFIC ACTIVITY -

My scientific activity is dedicated to:

1. model decision problems with an interesting formal structure;
2. study the computational complexity and the approximability of the resulting models;
3. design, implement and experimentally evaluate exact and heuristic algorithms to solve them.

The problems studied mainly fall within the field of Combinatorial Optimization and aim to achieve effective and efficient decisions. The implemented algorithms exploit sophisticated data structures, combinatorial properties and mathematical programming techniques. The application fields are manifold and lead to joint works with national and international experts of other scientific disciplines.

Honours and awards

In November 2011 Fabio Colombo, Marco Trubian and I won the second prize of the *RAS 2011 Problem Solving Competition*, organized by INFORMS on the optimization of railway freight transportation.

In June 2008 the MicroLab team of the Politecnico of Milan won the third prize of the *2nd MEMOCODE Co-Design Contest*, organized by the ACM-IEEE International Conference on Formal Methods and Models for Codesign on sorting a database of encrypted records.

In September 2006, the Master's thesis of F. Gandellini ("Mathematical programming algorithms for the scheduling of Earth observation satellites") won the Camerini-Carraresi Prize.

Editorial positions

Associate Editor of the *IEEE Transactions on Automation Science and Engineering (IEEE T-ASE)* since October 2017

Member of the Scientific Program Committee of the *International Conference on Operations Research and Enterprise Systems (ICORES)* since 2018 (three editions)

Member of the Scientific Program Committee of the *Workshop on Discrete Event Systems (WODES)* since 2018 (three editions) (four editions)

Associate Editor of the *IEEE International Conference on Automation Science and Engineering (IEEE-CASE)* for two editions (2015 and 2016)

Member of the Scientific Committee of the *Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)* since 2016 and **co-organizer** of the 2008 and 2016 editions

Co-organizer of the *Italian Logic Synthesis Day* since 2005

Reviewer for *Annals of Operations Research, Applied Mathematics and Computation, Automatica, Computers & Industrial Engineering, Computers & Operations Research, Discrete Applied Mathematics, Discrete Event Dynamic Systems, Engineering Applications of Artificial Intelligence, EURO Journal on Transportation and Logistics, European Journal of Operational Research, IEEE Transactions on Automated Control, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Industrial Informatics, IEEE Transactions on Instrumentation and Measurement, IEEE Transactions on Systems, Man and Cybernetics, IMA Journal of Mathematical Control and Information, Information Sciences, International Journal of Systems Science, International Transactions in Operational Research, Journal of Combinatorial Optimization, Journal of Computational and Applied Mathematics, Journal of Heuristics,*

4OR, Journal of System Architecture, Networks, Non Linear Dynamics in Psychology and Life Sciences, Operational Research - An International Journal, Optimization Letters, Robotics and Computer-Integrated Manufacturing, Swarm and Evolutionary Computation, Transportation Research, Transportation Science and several conferences on Computer Science, Control Science and Operations Research

Scientific contributions

The following schematical exposition of contributions to the literature is organized by application fields.

Note: The reference symbols indicate the kind of publication: International Paper (IP), Submitted International Paper (SP), International Book Chapter (IB), International Conference (IC), Submitted International Conference (SC), National Book Chapter (NB), International Oral Communication (IO), National Oral Communication (NO), Technical Report (TR), Thesis (T)

A. Network design problems

These works concern exact and heuristic algorithms for the design of telecommunication, transportation and gene networks [T1, IP39, IP34, IC21, IP25, IP21, IC13, IP22]. The works on fiberoptic networks [NO15] belong to a research project financed by Alcatel Italy to integrate sophisticated algorithms in their design support systems. The work on freight railway transportation [IO4] has won the second prize in *RAS 2011 Problem Solving Competition*, managed by *INFORMS*.

B. Covering, partition and packing problems

These works concern a heterogeneous set of applications whose model requires to identify subsets which provide a partition, covering or packing of a given ground set. After modelling the problem, they analyse its computational complexity and approximability [IP41, TR9, IP38, IC18, IP16] and propose exact and heuristic solving algorithms [TR8, NO17, IC37, IC35, IP46, TR11, NO3, IP12, NO2, NO5, IP15, IP17, IC11, IP8, IP9, IP10, ?, ?]. The works on health care systems refer to project *DECEMBRIA - Decisioni in Emergenza Sanitaria* (Decisions in Sanitary Emergency), financed by Regione Lombardia [IO5, IC22, IC19, NO1, IP18].

C. Dispersion problems

These works concern heuristic algorithm to extract from a given set a subset of elements with maximum or with equitable dispersion. The first works, in particular, have reduced by 2 – 3 orders of magnitude the computational time with respect to the previous state of the art [NO10, IP33, TR1, IP26, TR3, IP31, IC16, IO3, IP13].

D. Routing problems

These works concern heuristic algorithms for the routing of vehicles employed in the transportation of goods and people. Some works have led to software used in industrial applications or in feasibility studies, other works to cooperations with international research groups (Université de Troyes and Université Paris XIII Nord). The main problems considered are the *Vehicle Routing Problem with Time Windows* [IP45, TR13, NO11], the *VRPTW with Pickup and Delivery* [TR7, NO16], the *Overnight Security Service Problem* [IP44], the *Dial-a-Ride Problem* [TR10, NB2, NO18, IC32, IO8, TR5], the *Split Delivery Vehicle Routing Problem* [NO12, IO7] and the *Travelling Salesman Problem with Rear-Loading* [NO8].

E. Scheduling problems

These works concern algorithms for the time sequencing of jobs in very different application fields, both heuristic [IP42, NO14, TR4, IC26] and exact [IO2, IP11, ?]. The works on satellite earth observations [IP32, ■

NO13] belong to the activities of the *Galileo* positioning system. The works on multi-skill call-centers have generated industrial grants [IP28, NO4, IP19]. The works on regular timetabling [NB1, ?, ?, NO7] and on processor scheduling [IC29, IP29, IC5] have generated minor PhD thesis at the Politecnico di Milano.

F. Supervisory control of flexible manufacturing systems

The works in this field concern the modelling of Flexible Manufacturing Systems with Petri nets and their supervisory control, that is the design of a control subsystem to prevent the occurrence of deadlocks or livelocks in the net. The control subsystem is modelled as an additional Petri net whose places (monitors) are suitably connected to the transitions of the original net so as to forbid dangerous states. The main criteria to evaluate the quality of the control are the permissivity of the resulting systems (that is, the number of reachable states) and the size of the control system (that is, the number of monitors and additional links). Further constraints can be the occurrence of uncontrollable and/or unobservable events (i. e., transitions) and the need to distribute the control system into subsystems operating on different parts of the original net. The classical approach to these problems consisted in identifying subnets known as siphons which, if left uncontrolled, could generate deadlocks, and to associate a monitor to each siphon. This approach does not guarantee an optimal permissivity and size, and has strong computational limits. My first work in the field improved the classical approach determining nearly optimal solution with respect to permissivity and size in very limited time [IC34, IC33, TR6, IP40, IC31, IC25, IC15, IC27, IP36, IC17, IP30]. The following works abandoned the siphon approach in favour of more general techniques (linear and nonlinear classifiers [IP20, IC14, IC12, IP23]) which guarantee an optimal solution. Finally, these techniques have been extended to uncontrollable systems [IP24, IC8, IC9] and to decentralized control problems [IP14, IC10, IC7]. These works derive from cooperations with Italian (Politecnico di Milano, University of Salerno) and international (Georgia Tech Institute) research groups.

G. Logic synthesis

These works have led to cooperations with Italian research groups (Politecnico di Milano, University of Pisa) and to the institution of a regular yearly workshop since 2005 (National Logic Synthesis Day) [IC36, IP46, IC30, TR2, IB1, IP35, IC23, IC24].

H. Other works

I have also studied the connectivity of hydrogen bonds in oligomeric solutions [IP37], the nonlinear dynamics of creativity [IP47], the Environmental Impact Assessment of tramway lines [TR12], the definition of image contrast measures [IC20, NO6, IP7], the Singly Constrained Assignment Problem [NO9] and the Multi-Weber Problem [IO6].

Bibliometric indices

- 47 international journal papers (plus 2 under revision)
- 37 international conference papers
- 1133 citations over 21 years (about 54 citations per year), among which 493 from 2016 to 2020 (bout 99 citations per year) [Scopus data]
- H-index = 18 [Scopus data]

Special issues editing

- [EI1] A. Ceselli, R. CORDONE, and G. Righini (eds.). Special issue of *Electronic Notes in Discrete Mathematics*, 55:1–210, November 2017.
- [EI2] A. Ceselli and R. CORDONE (eds.). Special issue of *Discrete Applied Mathematics*, 253:1–200, January 2019.

International journal papers

- [IP1] M. Bruglieri, R. CORDONE, and L. Liberti. Maximum feasible subsystems of distance geometry constraints. *Journal of Global Optimization*, 2021. [accepted].
- [IP2] M. Bruglieri, R. CORDONE, I. Lari, F. Ricca, and A. Scozzari. On finding connected balanced partitions of trees. *Discrete Applied Mathematics*, 299:1–16, August 2021. [DOI: 10.1016/j.dam.2021.04.002].
- [IP3] M. Bruglieri and R. CORDONE. Metaheuristics for the minimum gap graph partitioning problem. *Computers & Operations Research*, 132:105301, August 2021. [DOI: 10.1016/j.cor.2021.105301].
- [IP4] R. CORDONE and P. Hosteins. A bi-objective model for the single-machine scheduling problem with rejection cost and total tardiness minimization. *Computers & Operations Research*, 102:130–140, February 2019. [DOI: 10.1016/j.cor.2018.10.006].
- [IP5] A. Cirigliano, R. CORDONE, A. A. Nacci, and M. D. Santambrogio. Towards smart building design automation: Extensible framework for indoor localization systems deployment. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 37(1):133–145, January 2018. [DOI: 10.1109/TCAD.2016.2638448].
- [IP6] R. CORDONE, P. Hosteins, and G. Righini. A branch-and-bound algorithm for the prize-collecting single-machine scheduling problem with deadlines and total tardiness minimization. *INFORMS Journal on Computing*, 30(1):168–180, Winter 2018. [DOI: 10.1287/ijoc.2017.0772].
- [IP7] G. Simone, R. CORDONE, R. P. Serapioni, and M. Lecca. On edge-aware path-based color spatial sampling for retinex: from termite retinex to light energy driven termite retinex. *Journal of Electronic Imaging*, 26(3):031203, May 2017. [DOI: 10.1117/1.JEI.26.3.031203].
- [IP8] F. Colombo, R. CORDONE, and G. Lulli. The multimode covering location problem. *Computers & Operations Research*, 67:25–33, March 2016. [DOI: 10.1016/j.cor.2015.09.003].

- [IP9] R. CORDONE and G. Lulli. Multimode extensions of combinatorial optimization problems. *Electronic Notes in Discrete Mathematics*, 55, December 2016. [DOI: 10.1016/j.endm.2016.10.005].
- [IP10] M. Bruglieri and R. CORDONE. Partitioning a graph into minimum gap components. *Electronic Notes in Discrete Mathematics*, 55, December 2016. [DOI: 10.1016/j.endm.2016.10.009].
- [IP11] R. CORDONE, P. Hosteins, and G. Righini. The prize-collecting scheduling problem with deadlines. *Electronic Notes in Discrete Mathematics*, 55, December 2016. [DOI: 10.1016/j.endm.2016.10.015].
- [IP12] F. Colombo, R. CORDONE, and G. Lulli. A variable neighborhood search algorithm for the multimode set covering problem. *Journal of Global Optimization*, 63(3):461–480, November 2015. [DOI: 10.1007/s10898-013-0094-6].
- [IP13] R. Aringhieri, R. CORDONE, and A. Grosso. Construction and improvement algorithms for dispersion problems. *European Journal of Operational Research*, 242(1):21–33, April 2015. [DOI: 10.1016/j.ejor.2014.09.058].
- [IP14] F. Basile, R. CORDONE, and L. Piroddi. A branch and bound approach for the design of decentralized supervisors in Petri net models. *Automatica*, 52:322–333, February 2015. [DOI: 10.1016/j.automatica.2014.12.004].
- [IP15] A. Ceselli, F. Colombo, R. CORDONE, and M. Trubian. Employee workload balancing by graph partitioning. *Discrete Applied Mathematics*, 165:112–129, March 2014. [DOI: 10.1016/j.dam.2013.02.014].
- [IP16] A. Ceselli, F. Colombo, and R. CORDONE. Balanced compact clustering for efficient range queries in metric spaces. *Discrete Applied Mathematics*, 169:43–67, May 2014. [DOI: 10.1016/j.dam.2013.12.019].
- [IP17] F. Colombo, R. CORDONE, and M. Trubian. Column-generation based bounds for the homogeneous areas problem. *European Journal of Operational Research*, 236(2):695–705, July 2014. [DOI: 10.1016/j.ejor.2013.12.030].
- [IP18] A. Bettinelli, R. CORDONE, F. Ficarelli, and G. Righini. Simulation and optimization models for emergency management systems planning. *Journal of Emergency Management*, 12(4):287–301, July/August 2014. [DOI: 10.5055/jem.2014.0180].
- [IP19] R. CORDONE, P. Hosteins, A. Piselli, P. Ravizza, and G. Righini. Optimal selection of contracts and work-shifts in multi-skill call centers. *EURO Journal on Computational Optimization*, 2(4):247–277, November 2014. [DOI: 10.1007/s13675-013-0019-7].
- [IP20] R. CORDONE and L. Piroddi. Parsimonious monitor control of Petri Net models of Flexible Manufacturing Systems. *IEEE Transactions on Systems, Man and Cybernetics, Part A*, 43(1):215–221, January 2013. [DOI 10.1109/TSMCA.2012.2190139].
- [IP21] R. CORDONE and G. Lulli. An integer optimization approach for reverse engineering of gene regulatory networks. *Discrete Applied Mathematics*, 161(4–5):580–592, March 2013. [DOI 10.1016/j.dam.2012.02.010].
- [IP22] R. CORDONE and G. Lulli. A GRASP metaheuristic for microarray data analysis. *Computers & Operations Research*, 40(12):3108–3120, December 2013. [DOI: 10.1016/j.cor.2012.10.008].
- [IP23] R. CORDONE, A. Nazeem, L. Piroddi, and S. Reveliotis. Designing optimal deadlock avoidance policies for sequential resource allocation systems through classification theory: Existence results and customized algorithms. *IEEE Transactions on Automatic Control*, 58(11):2772–2787, November 2013. [DOI: 10.1109/TAC.2013.2266952].

- [IP24] F. Basile, R. CORDONE, and L. Piroddi. Integrated design of optimal supervisors for the enforcement of static and behavioral constraints in Petri net models. *Automatica*, 49(11):3432–3439, November 2013. [DOI: 10.1016/j.automatica.2013.08.018].
- [IP25] R. CORDONE and G. Passeri. Solving the quadratic minimum spanning tree problem. *Applied Mathematics and Computation*, 218(23):11597–11612, August 2012. [DOI: 10.1016/j.amc.2012.05.043].
- [IP26] Roberto Aringhieri and R. CORDONE. Comparing local search metaheuristics for the maximum diversity problem. *Journal of the Operational Research Society*, 62(2):266–280, February 2011. [DOI: 10.1057/jors.2010.104].
- [IP27] R. CORDONE and F. Redaelli. Optimizing the demand captured by a railway system with a regular timetable. *Transportation Research Part B: Methodological*, 45(2):430–446, February 2011. [DOI: 10.1016/j.trb.2010.09.001].
- [IP28] R. CORDONE, A. Piselli, P. Ravizza, and G. Righini. Optimization of multi-skill call centers contracts and work-shifts. *Service Science*, 3(1):67–81, Spring 2011. [DOI: 10.1287/serv.3.1.67].
- [IP29] R. CORDONE, M. Maggioni, F. Redaelli, M. A. Redaelli, M. D. Santambrogio, and D. Sciuto. Partitioning and scheduling of task graphs on partially dynamically reconfigurable FPGAs. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 28(5):662–675, May 2009. [DOI: 10.1109/TCAD.2009.2015739].
- [IP30] L. Piroddi, R. CORDONE, and I. Fumagalli. Combined siphon and marking generation for deadlock prevention in Petri nets. *IEEE Transactions on Systems, Man and Cybernetics, Part A*, 39(3):650–661, May 2009. [DOI: 10.1109/TSMCA.2009.2013189].
- [IP31] R. Aringhieri, M. Bruglieri, and R. CORDONE. Optimal results and tight bounds for the maximum diversity problem. *Foundations of Computing and Decision Sciences*, 34(2):73–86, 2009.
- [IP32] R. CORDONE, F. Gandellini, and G. Righini. Solving the swath segment selection problem through lagrangean relaxation. *Computers and Operations Research*, 35(3):854–862, March 2008. [DOI: 10.1016/j.cor.2006.04.005].
- [IP33] R. Aringhieri, R. CORDONE, and Y. Melzani. Tabu search vs. GRASP for the maximum diversity problem. *4OR: A Quarterly Journal of Operations Research*, 6(1):45–60, 2008. [DOI: 10.1007/s10288-007-0033-9].
- [IP34] R. CORDONE and M. Trubian. A relax-and-cut algorithm for the knapsack node weighted Steiner tree problem. *Asia-Pacific Journal of Operations Research*, 25(3):373–391, June 2008. [DOI: 10.1142/S0217595908001791].
- [IP35] A. Bernasconi, V. Ciriani, and R. CORDONE. The optimization of k -EXOR-projected sums of products: Computational complexity, approximability and empirical experiments. *ACM Transactions on Design Automation of Electronic Systems*, 13(2):35:1–35:29, April 2008. [DOI: 10.1145/1344418.1344431].
- [IP36] R. CORDONE, I. Fumagalli, and L. Piroddi. Selective siphon control for deadlock prevention in Petri nets. *IEEE Transactions on Systems, Man and Cybernetics, Part A*, 38(6):1337–1348, November 2008. [DOI: 10.1109/TSMCA.2008.2003535].
- [IP37] F. Gangemi, G. Longhi, S. Abbate, F. Lebon, R. CORDONE, G. P. Ghilardi, and S. L. Fornili. Molecular dynamics simulation of 26-unit segments of p(NIPAAm) and of p(NIPAAm) “doped” with amino-acid-based comonomers. *Journal of Physical Chemistry, Part B*, 112(38):11896–11906, August 29, 2008. [DOI: 10.1021/jp803545p].
- [IP38] R. CORDONE. A subexponential algorithm for the coloured tree partition problem. *Discrete Applied Mathematics*, 155(10):1326–1335, May 2007. [DOI: 10.1016/j.dam.2007.02.001].

- [IP39] R. CORDONE and M. Trubian. An exact algorithm for the node weighted Steiner tree problem. *4OR: A Quarterly Journal of Operations Research*, 4(2):124–144, July 2006. [DOI: 10.1007/s10288-005-0081-y].
- [IP40] R. CORDONE, L. Ferrarini, and L. Piroddi. Enumeration algorithms for minimal siphons with place constraints in Petri nets. *IEEE Transactions on Systems, Man and Cybernetics, Part A*, 35(6):844–854, November 2005. [DOI: 10.1109/TSMCA.2005.853504].
- [IP41] R. CORDONE and F. Maffioli. On the complexity of graph tree partition problems. *Discrete Applied Mathematics*, 134(1–3):51–65, January 5 2004. [DOI: 10.1016/S0166-218X(03)00340-8].
- [IP42] R. Aringhieri and R. CORDONE. The multicommodity multilevel bottleneck assignment problem. *Electronic Notes in Discrete Mathematics*, 17:37–40, October 2004. [DOI: 10.1016/j.endm.2004.03.010].
- [IP43] A. Chierici, R. CORDONE, and R. Maja. The demand-dependent optimization of regular train timetables. *Electronic Notes in Discrete Mathematics*, 17:99–104, October 2004. [DOI: 10.1016/j.endm.2004.03.017].
- [IP44] R. Wolfler Calvo and R. CORDONE. A heuristic approach to the overnight security service problem. *Computers and Operation Research*, 30(9):1269–1287, August 2003. [DOI: 10.1016/S0305-0548(02)00070-9].
- [IP45] R. CORDONE and R. Wolfler Calvo. A heuristic for the vehicle routing problem with time windows. *Journal of Heuristics*, 7(2):107–129, March 2001. [DOI: 10.1023/A:1011301019184].
- [IP46] R. CORDONE, F. Ferrandi, D. Sciuto, and R. Wolfler Calvo. An efficient heuristic approach to solve the unate covering problem. *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 20(12):1377–1388, December 2001. [DOI: 10.1109/43.969431].
- [IP47] S. Rinaldi, R. CORDONE, and R. Casagrandi. Instabilities in creative professions: a minimal model. *Journal of Non Linear Dynamics in Psychology and Life Sciences*, 4(3):255–273, July 2000. [DOI: 10.1023/A:1009536612422].

Papers submitted to international journals

- [SP1] F. Basile, R. CORDONE, and L. Piroddi. Supervisory control of timed discrete event systems with logical and timed specifications. [submitted for publication to the *IEEE Transactions on Automatic Control*].
- [SP2] R. CORDONE, D. Franchi, and A. Scozzari. Cardinality constrained connected balanced partitions of trees under different criteria. [submitted for publication to *Discrete Optimization*].

International book chapters

- [IB1] A. Bernasconi, V. Ciriani, and R. CORDONE. Logic synthesis of EXOR-projected sums of products. In G. De Micheli, S. Mir, and R. Reis, editors, *VLSI-SoC: Research Trends in VLSI and Systems on Chip*, volume 249 of *IFIP International Federation for Information Processing*, pages 241–257. Springer-Verlag, Boston, 2008.

International conference papers with review

- [IC1] M. Bruglieri, R. CORDONE, and L. Liberti. Maximum feasible subsystems of distance geometry constraints. In *Proceedings of the 18th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Ischia, Italy, September 14-16, 2020.
- [IC2] M. Bruglieri, R. CORDONE, I. Lari, F. Ricca, and A. Scozzari. Some polynomial special cases for the MGGPP. In *Proceedings of the 16th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Paris, France, June 6-8, 2018.

- [IC3] M. Bruglieri, R. CORDONE, and V. Caurio. A metaheuristic for the minimum gap graph partitioning problem. In *Proceedings of the 15th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Köln, Germany, June 6-8, 2017.
- [IC4] R. CORDONE and G. Righini. Upper and lower bounds for the swath segment selection problem. In *Proceedings of the 15th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Köln, Germany, June 6-8, 2017.
- [IC5] R. CORDONE, G. M. Fumarola, M. Mazzucchelli, M. Rabozzi, and M. Santambrogio. Preemption-aware planning on Big-Data Systems. In *Proceedings of the 21st ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP 2016)*, Barcelona, Spain, March 12-16, 2016. ACM. [DOI: 10.1145/2851141.2851187].
- [IC6] A. Cirigliano, A. A. Nacci, R. CORDONE, and M. D. Santambrogio. Floor plan design and automatic nodes deployment for indoor location and monitoring systems. In *Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2016)*, pages 45–48, Heidelberg, Germany, September 12-16, 2016. ACM. [DOI: 10.1145/2968219.2971415].
- [IC7] F. Basile, R. CORDONE, and L. Piroddi. Decentralized monitors design for Petri net models. In *Proceedings of the 12th IFAC - IEEE International Workshop on Discrete Event Systems (WODES'14)*, pages 73–79, Cachan, France, May 14-16, 2014. IEEE. [DOI: 10.3182/20140514-3-FR-4046.00048].
- [IC8] F. Basile, R. CORDONE, and L. Piroddi. Parsimonious deadlock-free Petri net models of flexible manufacturing systems. In *Proceedings of the American Control Conference (ACC) 2013*, pages 119–124, Washington, DC, June 17-19, 2013. IEEE. [DOI: 10.1109/ACC.2013.6579824].
- [IC9] F. Basile, R. CORDONE, and L. Piroddi. Compact supervisors for general constraint enforcement in Petri net models with uncontrollable transitions. In *Proceedings of the 12th European Control Conference (ECC) 2013*, pages 143–148, Zurich, Switzerland, July 17-19, 2013. IEEE.
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- [IC11] F. Colombo, R. CORDONE, and M. Trubian. Upper and lower bounds for the homogeneous areas problem. In *Proceedings of the 11th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Muenchen, Germany, May 29-31, 2012.
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- [IC13] R. CORDONE and G. Lulli. A Lagrangian relaxation approach for gene regulatory networks. In *Proceedings of the 10th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Frascati, Italy, June 2-4, 2011.
- [IC14] R. CORDONE and L. Piroddi. Monitor optimization in Petri Net control. In *Proceedings of the IEEE 7th International Conference on Automation Science and Engineering (CASE2011)*, pages 413–418, Trieste, Italy, August 24-27, 2011. [DOI: 10.1109/CASE.2011.6042440].
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- [IC16] A. Ceselli, R. CORDONE, Y. Melzani, and G. Righini. Optimization algorithms for the max edge weighted clique problem with multiple choice constraints. In *Proceedings of the 9th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, pages 3365–70, Cologne, Germany, May 25-27, 2010.
- [IC17] L. Piroddi, R. CORDONE, and I. Fumagalli. Efficient deadlock prevention in Petri nets through the generation of selected siphons. In *Proceedings of the 28th American Control Conference (ACC) 2009*, St. Louis, Missouri, June 10-12, 2009. [DOI: 10.1109/ACC.2009.5159861].
- [IC18] A. Ceselli, R. CORDONE, and M. Cremonini. Balanced clustering for efficient detection of scientific plagiarism. In *Proceedings of 8th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Paris, France, June 2-4, 2009.
- [IC19] R. CORDONE, F. Ficarelli, and G. Righini. Bounds and solutions for strategic, tactical and operational ambulance location. In *Proceedings of 8th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, Paris, France, June 2-4, 2009.
- [IC20] A. Rizzi, G. Simone, and R. CORDONE. A modified algorithm for perceived contrast measure in digital images. In *Proceedings of the Fourth European Conference on Colour in Graphics, Imaging, and Vision (CGIV) 2008*, Terrassa, Barcelona, June 9-13, 2008.
- [IC21] R. CORDONE and G. Passeri. Heuristic and exact approaches for the quadratic minimum spanning tree problem. In *Proceedings of the 7th Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)*, pages 168–171, Gargnano, Italy, May 13-15, 2008.
- [IC22] R. CORDONE, F. Ficarelli, and G. Righini. Models and algorithms for location and relocation of ambulances. In *Proceedings of the XI International Symposium On Locational DEcisions (ISOLDE XI)*, Santa Barbara, CA, June 26 2008.
- [IC23] A. Bernasconi, V. Ciriani, and R. CORDONE. On projecting sums of products. In *Proceedings of the 11th EUROMICRO Conference on Digital System Design (DSD 2008)*, Parma, Italy, September 3–5 2008. [DOI: 10.1109/DSD.2008.105].
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National book chapters

- [NB1] R. CORDONE, F. Cristiano, R. Maja, and P. Rapinesi. Il progetto di un orario ferroviario cadenzato: Un approccio analitico e un pacchetto software. In *Metodi e Tecnologie dell'Ingegneria dei Trasporti*, volume 1798.11. Franco Angeli, 2002.
- [NB2] A. Colorni, R. CORDONE, E. Laniado, and R. Wolfler Calvo. L'innovazione nei trasporti: Pianificazione e gestione. In S. Pallottino and A. Sciomachen, editors, *Scienze delle Decisioni per i Trasporti*, chapter 28, pages 656–688. Franco Angeli, 1999.

Oral communications to international conferences

- [IO1] A. Scozzari, I. Lari, F. Ricca, J. Puerto, R. CORDONE, and M. Bruglieri. Uniform partition of graphs: Complexity results, algorithms and formulations. In *Proceedings of Discrete Mathematics Days (ROADEF 2016)*, Sevilla, Spain, 27-29, 2018.
- [IO2] R. CORDONE, Pierre Hosteins, and Giovanni Righini. Exact algorithms for the prize-collecting single machine problem with deadlines. In *Proceedings of 17th Conference of the French Society of Operations Research (ROADEF 2016)*, Compiègne, France, February 10-12, 2016.
- [IO3] R. Aringhieri, R. CORDONE, and A. Grosso. The role of diversification when solving dispersion problems. In *Proceedings of the 25th Conference of European Chapter on Combinatorial Optimization (ECCO2012)*, Antalya, Turkey, April 26-28, 2012.
- [IO4] R. CORDONE F. Colombo and M. Trubian. A column-row generation heuristic for the train design optimization problem. In *INFORMS 2011 Annual Meeting RAS 2011 Problem Solving Competition*, Charlotte, NC, November 13-16, 2011.

- [IO5] A. Ceselli, R. CORDONE, A. Pinciroli, G. Righini, and M. Trubian. Mathematical programming methods for the optimization of the emergency health-care service in Milan. In *Proceedings of INFORMS Annual Meeting*, Seattle, WA, November 4-7th, 2007.
- [IO6] S. Agazzi, G. Righini, and R. CORDONE. New neighborhoods in local search for the multi-Weber problem. In *Proceedings of EURO XXII*, Prague, 8-11th, 2007.
- [IO7] J. Melechovský, R. Wolfler Calvo, C. Prins, and R. CORDONE. A combined heuristic algorithm to solve a split delivery vehicle routing problem. In *Proceedings of EURO XXII*, Prague, 8-11th, 2007.
- [IO8] R. Wolfler Calvo, A. Colomi, and R. CORDONE. A heuristic for the Dial-a-Ride problem. In *Proceedings of the IFOR99 Conference*, Beijing, China, August 16-20th, 1999.

Oral communications to national conferences

- [NO1] R. CORDONE and G. Righini. Strategic, tactic and operational decision problems in the optimization of emergency management systems. In *Atti del Convegno AIRO Winter 2011*, Cortina d'Ampezzo, Italy, February 7-11th 2011.
- [NO2] F. Colombo, R. CORDONE, and M. Trubian. On the partition of an administrative region into homogeneous districts. In *Atti del Convegno AIRO 2011*, Brescia, Italy, September 6-9th 2011.
- [NO3] R. CORDONE and G. Lulli. The multi-mode set covering problem. In *Atti del Convegno AIRO 2011*, Brescia, Italy, September 6-9th 2011.
- [NO4] P. Hosteins, R. CORDONE, and G. Righini. A MIP-based heuristic for the optimization of contracts and work-shifts in complex multi-skill call centers. In *Atti del Convegno AIRO 2011*, Brescia, Italy, September 6-9th 2011.
- [NO5] A. Ceselli, R. CORDONE, and M. Trubian. Employee workload balancing by graph partitioning. In *Atti del Convegno AIRO 2009*, Siena, Italy, September 7-10th 2009.
- [NO6] G. Simone and R. CORDONE. Spatial patterns in contrast measure. In *Atti della Quarta Conferenza Nazionale del Gruppo del Colore*, Como, Italy, September 17-19th 2008.
- [NO7] R. Maja, M. Bruglieri, and R. CORDONE. Cadenzamento degli orari e delle coincidenze dei servizi integrati di trasporto in relazione alla domanda potenziale. In *Atti del XV convegno nazionale SIDT 2008*, Arcavacata di Rende, Italy, June 9-10th 2008.
- [NO8] R. CORDONE, F. Gandellini, and G. Righini. An additive bounding algorithm for the travelling salesman problem with rear-loading constraints. In *Atti del Convegno AIRO WINTER 2007*, Cortina d'Ampezzo, Italy, February 5-9th 2007. AIRO.
- [NO9] A. Ceselli and R. CORDONE. Additive bounds for the singly constrained assignment problem. In *Atti del Convegno AIRO 2007*, Genova, September 5-8th 2007. AIRO.
- [NO10] R. Aringhieri and R. CORDONE. Comparing local search metaheuristics to solve the maximum diversity problem. In *Atti del Convegno AIRO 2006*, Cesena, Italy, September 12-15th, 2006. AIRO.
- [NO11] R. CORDONE, G. Righini, and M. Salani. An optimization algorithm for complex vehicle routing problems. In *Atti del Convegno AIRO 2005*, Camerino, Italy, September 6-9th, 2005. AIRO.
- [NO12] R. CORDONE, R. Wolfler Calvo, and J. Melechovský. A granular tabu search heuristic to solve the split delivery vehicle routing problem. In *Atti del Convegno AIRO 2005*, Camerino, Italy, September 6-9th, 2005. AIRO.
- [NO13] N. Bianchessi, R. CORDONE, and G. Righini. The multi-orbit multi-satellite planning and scheduling problem. In *Atti del Convegno AIRO 2005*, Camerino, Italy, September 6-9th, 2005. AIRO.

- [NO14] R. Aringhieri and R. CORDONE. Balancing workers' shifts in a junk removal company through a multicommodity multilevel bottleneck assignment approach. In *Atti del Convegno AIRO 2004*, Lecce, Italy, September 7-10th, 2004. AIRO.
- [NO15] R. CORDONE and F. Malucelli. Routing of protected traffic in fiberoptic networks. In *Atti del Convegno AIRO 2002*, L'Aquila, Italy, September 10-13th, 2002. AIRO.
- [NO16] R. CORDONE. A guided restart algorithm for the vehicle routing problem with pick-up and delivery. In *Atti del Convegno AIRO 2001*, Cagliari, Italy, September 4-7th, 2001. AIRO.
- [NO17] R. CORDONE and M. Trubian. A column generation heuristic for a graph tree partition problem. In *Atti del Convegno AIRO 2000*, Milano, Italy, September 18-21th, 2000. AIRO.
- [NO18] A. Colomi, R. CORDONE, V. Morrocchi, and D. Rossi. Modelli e sistemi di gestione di servizi a chiamata. In *Atti del Seminario "La ricerca nel settore dei trasporti al Politecnico"*, Milano, Italy, December 19th, 2000. Centro Interdipartimentale di Ricerca nei Trasporti.

Internal reports (not published otherwise)

- [TR1] R. Aringhieri, R. CORDONE, and Y. Melzani. An Ant Colony Optimization approach to the maximum diversity problem. Note del Polo 109, Università degli Studi di Milano, Crema, October 2007.
- [TR2] A. Bernasconi, V. Ciriani, and R. CORDONE. EXOR-projected sum of products. Technical Report TR-06-10, Università degli Studi di Pisa, Pisa, July 3rd, 2006. [available at <http://compass2.di.unipi.it/TR/Files/TR-06-10.pdf.gz>].
- [TR3] R. Aringhieri and R. CORDONE. Better and faster solutions for the maximum diversity problem. Note del Polo 93, Università degli Studi di Milano, Crema, March 2006.
- [TR4] R. Aringhieri, A. Ceselli, and R. CORDONE. Models and algorithms for balanced rostering with limited skills. Note del Polo 72, Università degli Studi di Milano, Crema, March 2005.
- [TR5] R. CORDONE. An evolutionary approach to the Dial-a-Ride problem. Note del Polo 54, Università degli Studi di Milano, Crema, June 2003.
- [TR6] R. CORDONE, L. Ferrarini, and L. Piroddi. A recursive algorithm for minimal siphons detection in Petri nets. Note del Polo 53, Università degli Studi di Milano, Crema, June 2003.
- [TR7] R. CORDONE. An algorithm for the vehicle routing problem with pickup and delivery and time windows. Note del Polo 47, Università degli Studi di Milano, Crema, January 2003.
- [TR8] R. CORDONE. Experience on a multicommodity flow formulation for the Knapsack constrained Prize Collecting Steiner Tree Problem. Internal Report (DEI 2001.6), Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano, May 2nd 2001.
- [TR9] R. CORDONE. A short note on graph tree partition problems with assignment or communication objective functions. Internal Report (DEI 2001.7), Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano, May 2nd 2001.
- [TR10] R. CORDONE. Un modello di simulazione della domanda per sistemi di trasporto a chiamata. Internal Report (DEI 2001.38), Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano, May 8th 2001. [in Italian].
- [TR11] R. CORDONE. A surrogate heuristic for the set packing problem. Internal Report (DEI 2000.39), Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano, May 8th 2001.
- [TR12] A. Colomi, R. CORDONE, and S. Muratori. Studio di prefattibilità per la metrotranvia di Como. Technical report, Centro in Economia e Gestione per l'Ambiente e il Territorio, Consorzio Poliedra - Politecnico di Milano, Milano, October 2000.

[TR13] R. CORDONE and R. Wolfer Calvo. Note on time window constraints in routing problems. Internal Report (DEI 96-005), Dipartimento di Elettronica e Informazione, Politecnico di Milano, Milano, 1996.

[TR14] Technical report.

Thesis

[T1] R. CORDONE. *Optimal Graph Tree Partitions*. Ph. D. thesis, Politecnico di Milano, Milan, 2000.

[T2] R. CORDONE. I vincoli temporali nei problemi di routing e scheduling: teoria e applicazione a un algoritmo per il vehicle routing problem with time windows. Tesi di laurea, Politecnico di Milano, Milano, April 1996.

- TEACHING -

Ph.D. courses

2021	<i>Heuristic algorithms for Combinatorial Optimization</i> (20 hours) for the Ph.D. program in Computer Science
2019	<i>Matheuristics for Combinatorial Optimization problems</i> (10 hours) for the Ph.D. program in Computer Science
2018	<i>Heuristic algorithms for Combinatorial Optimization</i> (20 hours) for the Ph.D. program in Computer Science
2006	<i>Greedy algorithms and constructive metaheuristics</i> , during the course <i>Heuristic algorithms</i> for the Ph.D. program in Computer Science (6 hours)
2001	<i>Introduction to multi-objective programming</i> for the Ph.D. program in Design of Urban Systems (3 hours)

Courses

The table reports the number of hours for each course. The hours labelled by (E) have been taught in English

A.A.	FRO	MMD	LMM	AE	ASD	CA	PAA	P
2020-21	-	48 (E)	-	48 (E)	48	-	-	-
2019-20	-	48 (E)	-	48 (E)	48	-	-	-
2018-19	-	48 (E)	-	48	44	-	-	-
2017-18	-	48	-	-	44	-	-	-
2016-17	-	-	-	48	44	-	-	-
2015-16	-	48	-	-	24	-	-	36
2014-15	-	-	-	48	-	-	-	36
2013-14	42 (E)	-	24	-	-	-	-	48
2012-13	42 (E)	-	-	-	-	-	-	48
2011-12	-	-	-	-	-	-	-	48
2010-11	-	-	-	-	-	-	-	48
2009-10	-	48	-	-	-	-	-	48
2008-09	-	48	-	-	-	-	48	-
2007-08	-	-	-	-	-	-	48	-
2006-07	-	48	-	-	-	-	48	-
2005-06	-	48	-	-	-	56	48	-
2004-05	-	-	-	-	-	56	48	-
2003-04	-	-	-	-	-	14	48	-
2002-03	50	-	-	-	-	-	-	-

FRO/FOR : *Fondamenti di Ricerca Operativa/Foundations of Operations Research* for the Master of Science in Computer Engineering, in Italian at Cremona, in English at Como

MMSD : *Metodi e Modelli per il Supporto alle Decisioni (Decision Methods and Models)* for the Master's Degree in Computer Science and Information Technology at Crema

CA : *Complementi di Algoritmi (Complements of Algorithms)* for the Master's Degree in Computer Science and Information Technology at Crema

PAA : *Progettazione e Analisi di Algoritmi (Algorithm Design and Analysis)* for the Master's Degree in Computer Science and Information Technology at Crema

AE : *Algoritmi Euristicici (Heuristic Algorithms)* for the Master's Degree in Computer Science at Milan

P : *Programmazione (Programming)* for the Master's Degree in Computer Science at Crema

ASD : *Algoritmi e Strutture Dati (Algorithms and Data Structures)* for the Master's Degrees in Computer Science and Mathematics at Milan

Practice lectures and laboratory sessions

A.A.	RO	SM	SS	AG	LT
2003-04	-	-	-	-	10
2002-03	40	-	-	-	10
2001-02	21	12 + 15	-	12	-
2000-01	-	12 + 12	12	-	-
1999-2000	-	12	12	-	-
1998-99	-	20	-	-	-

RO : *Operations Research* for the Master's Degree in Telecommunication Engineering at Milan

SM : *Modelling Software (LINDO, GAMS, MPL and AMPL)* for the Degree in Production Engineering at Lecco, Computer Engineering at Como and Milan and for the Master's Degree in Computer Engineering and Management Engineering at Como

SS : *Simulation Software (ARENA)* for the Degree in Computer Engineering at Como

AG : *Graph Algorithms* for the Master's Degree in Computer Engineering at Como

LT : *Formal Languages: Lex and Yacc* for the Master's Degree in Computer Science at Crema

On-line teaching

2004-2005 Contributions to the on-line course of *Algorithms and data structures* for the Master's Degree in Network Security at Crema

2001-2002 Tests and exercises for the on-line course of *Operations Research* for the Master's Degree in Computer Engineering at Como

From 2000 to 2001 On-line courses for the Formambiente Consortium
 - *Transportation systems for sustainable mobility*
 - *Dial-a-Ride: software for demand-responsive services*

From 1999 to 2003 (4 years) Technical manager of the website, forum and chat, support materials, for the course of *Operations Research* Master's Degree in Computer Engineering at Como

Monographic courses

2017–2018	“ <i>Data processing laboratory</i> ”, for the Master on “Smart logistic specialist: management and optimization of logistics and transportation systems” (20 hours)
2017	“ <i>Analytic and descriptive methods: statistics and simulation</i> ”, for the Master on “Smart logistic specialist: management and optimization of logistics and transportation systems” (24 hours)
2016	“ <i>Analytic and descriptive methods: statistics and simulation</i> ”, for the Master on “Smart logistic specialist: management and optimization of logistics and transportation systems” (24 hours)
2016	“ <i>Cracking the code interview</i> ”, training course for job interviews at high-tech companies, for the NECST-Lab of the Politecnico of Milan (12 hours)
2015	“ <i>Cracking the code interview</i> ”, training course for job interviews at high-tech companies, for the NECST-Lab of the Politecnico of Milan (9 hours)
2008	“ <i>Optimization modelling languages</i> ”, training course for high-school students (4 hours)
2007	“ <i>Teaching with optimization modelling languages</i> ”, training course for high-school teachers (3 hours)
2002	“ <i>Inventory control</i> ” module of the “ <i>Logistics</i> ” course for the Master’s Degree in Technologies for Information Society at Crema (12 hours)
2002	“ <i>Economic Order Quantity</i> ” for the Master’s Degree in Computer Science at Crema) (3 hours)
2001	“ <i>Environment and land management: actions for sustainable development. Sustainable Mobility</i> ” for the <i>Formez</i> Consortium (8 hours)

Online teaching

2020	Videorecordings of the lessons of Decision methods and models for the Computer Science degree
2020	Videorecordings of the lessons of Heuristic algorithms for the Computer Science degree
2020	Videorecordings of the laboratory lessons of Algorithms for the Mathematics degree
2005	Contributions to the online lessons of <i>Algorithms and data structure</i> for the System and networks security degree
2002	Exercises for the online lessons of <i>Operations Research</i> for the Computer Engineering degree
2000–2001	Online courses for the Formambiente Consortium - <i>Transportation systems for sustainable mobility</i> - <i>Dial-a-Ride services</i>
1999–2003	Forum and exam management for the <i>Operations Research</i> teaching of the Computer Engineering degree

- ORGANIZING ACTIVITY -

Scientific conference services

Member of the Program Committee of the 6th *International Conference on Operations Research and Enterprise Systems (ICORES 2017)*

Associate Editor of the *IEEE International Conference on Automation Science and Engineering (IEEE-CASE)* for the 2015 and 2016 editions

Member of the Scientific Committee of the *Cologne-Twente Workshop on Graphs and Combinatorial Optimization (CTW)* and **co-organizer** of the 2008 and 2016 editions

Co-organizer of the *Italian Logic Synthesis Day* for 13 annual editions since 2005

Ph.D. program services

Member of the board of the Computer Science program of the University of Milan from 2006

Member of the internal evaluation committee of the first-year Ph.D. students in the Computer Science Ph.D. program (2016)

Member of the committee for the final Ph.D. exam of Information Technology at the Politecnico of Milan in 2020

Member of the committee for the final Ph.D. exam of Computer Science at the University of Turin in 2018

Member of the committee for the final Ph.D. exam of Computer and Control Science at the Politecnico of Milan in 2014

Outside examiner of a Ph.D. thesis in Computer and Control Science at the Politecnico of Milan in 2013

Advisor for three minor thesis at the Politecnico of Milan

Committees for comparative assessment procedures

Member of the committee for two research associate positions in 2019

Member of the committee for a research associate position in 2018

Member of the committee for two research associate positions in 2017

Administrative services

Member of the committee for temporary teaching positions for the course of Data Science and Economics in 2018/19

Secretary for the meetings of the Department of Computer Science from 2010 to 2012

Technical services

Organizer of *Computer-Aided Problem Solving competitions*, at the University of Milan (2005 and 2006)

Coordinator of the implementation of a web application for the automatic compiling of C code at the University of Milan (2005)

Technical manager of the *Laboratorio per l'Analisi della Mobilità e dei Sistemi Innovativi di Trasporto (LAMSIT) (Laboratory for the Analysis of Mobility and Innovative Transportation Systems)* of the Politecnico di Milano from 2000 to 2001