

# Leo Liberti

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At a glance (June 23, 2017)			
<i>Endowments</i>	<i>Postdoc/Ph.D.</i>	<i>Refereed papers</i>	<i>Google Scholar H-index</i>
2.2MEUR	27	196	32 (26 since 2012)

## Main research interests

- Reformulations in mathematical programming
- Mixed-Integer Nonlinear Programming (MINLP), global and combinatorial optimization
- Distance geometry and bioinformatics
- Complex industrial systems and sustainable development

## Education

2007	<b>HDR</b>	Paris-Dauphine University, Paris, France	-
2004	<b>Ph.D.</b>	Imperial College London (UK)	-
1997	<b>Master</b> (Mathematics)	University of Turin (Italy)	110/110 cum Laude
1995	<b>B.Sc.</b> (Mathematics)	Imperial College London (UK)	First Class
1992	<b>European Baccalaureat</b>	European School, Culham (UK)	78/100

- HDR<sup>1</sup> thesis title: *Reformulation Techniques in Mathematical Programming*.  
Awarded on: 19th November 2007.  
Awarded by: Paris-Dauphine University, France.  
Coordinator: V. Paschos.  
Jury: Ph. Baptiste, A. Billionnet, A. Lisser, T. Westerlund.  
Referee reports: N. Maculan, Ph. Michelon, H. Sherali.
- Ph.D. thesis title: *Reformulation and Convex Relaxation Techniques for Global Optimization*.  
Awarded on: 15th March 2004.  
Awarded by: CPSE, Imperial College London, UK.  
Supervisor: Prof. C. Pantelides.  
Examiners: Prof. T. Westerlund, Prof. E.N. Pistikopoulos.

## Employment History

<sup>1</sup>*Habilitation à Diriger des Recherches*, a diploma that must be obtained prior to applying to Professorships in France.

Full-time:

2015-now	Research Director at CNRS (affiliation: LIX), France
2012-2015	Research Staff Member at IBM T.J. Watson Research Center, USA
2010-2012	Professor <sup>a</sup> at LIX, École Polytechnique, France.
2006-2010	Assistant Professor <sup>b</sup> at LIX, École Polytechnique, France.
2005-2006	Post-doc at LIX, École Polytechnique, France.
2003-2005	Post-doc at DEI, Politecnico di Milano, Italy.
1999-2003	Research assistant (RA1B) at CPSE, Imperial College London, UK.
1998-1999	Compulsory military service in Italy.
1997-1998	Computer science teacher at the CSEA school, Turin, Italy ( <a href="http://www.csea.it">www.csea.it</a> ).

<sup>a</sup>*Professeur Chargé de Cours*, equivalent to *Professeur des Universités de 2ème classe*. In France, this is considered a “full professor” position.

<sup>b</sup>*Maître de Conférence*.

Part-time:

2015-now	Professor <sup>a</sup> at Ecole Polytechnique, France.
2003-2005	Lecturer at Politecnico di Milano, Italy.
2001-2008	Co-founder of the Ipnos Partnership, London, UK ( <a href="http://www.ipnos.co.uk">http://www.ipnos.co.uk</a> ).
2000-2002	Co-founder of IrisTech S.r.l., Italy ( <a href="http://www.iris-tech.net">http://www.iris-tech.net</a> ).
1999-2004	Network administrator, Imperial College London.
1994-1997	Programming consultant, Imperial College London.

## Research Activities

- *Reformulations in mathematical programming*. Mathematical Programming (MP) is a formal language for describing optimization problems. A MP consists of parameters (encoding the problem instance), decision variables (encoding the solution), objective functions and constraints. Limited to functional forms which can be represented by Directed Acyclic Graphs (DAGs) the leaves of which are parameters and variables, the other nodes being the operators, a *reformulation* is a computable transformation of a MP  $P$  into another MP  $Q$  which shares some mathematical property  $\mathcal{P}$  with  $P$  (e.g.  $\mathcal{P} \equiv$  “all optima of  $Q$  are optima of  $P$ ”). Publications: [1, 3, 6, 7, 9, 120, 121, 123, 16, 14, 15, 132, 26, 19, 134, 135, 133, 138, 97, 144, 33, 158, 48, 100, 38, 165, 49, 55, 56, 58, 59, 61, 63, 64, 65, 66, 67, 68, 69, 70, 71, 87, 102, 103, 104, 105, 107, 109, 161, 169, 177, 178, 179, 181, 183, 186, 189, 190, 196, 199, 200, 210]. Software: ROSE [158, 103]. Patents: [203]. Funding: [2, 3, 4, 12, 15, 19, 23].
- *Global optimization and Mixed-Integer Nonlinear Programming*. Deterministic  $\varepsilon$ -approximate (spatial Branch-and-Bound) and heuristic solution algorithms for nonconvex Mixed-Integer Nonlinear Programs (MINLP). Publications: [3, 127, 128, 25, 26, 19, 80, 135, 40, 33, 30, 153, 83, 48, 154, 84, 85, 38, 165, 49, 53, 55, 57, 59, 64, 65, 66, 68, 69, 70, 71, 75, 213, 90, 92, 102, 104, 107, 108, 109, 166, 169, 176, 190, 191, 193, 196, 200, 211, 212]. Software: COUENNE [53], RECIPE [40, 176], *ooOPS* [212]. Funding: [9, 11, 30].
- *Combinatorial optimization*. Mixed-Integer Linear Programming (MILP) solution techniques: branching on general disjunctions, spherical cuts, symmetry-breaking, convex hull, binary quadratic programs; clustering by modularity maximization; problems on graphs: covering by bipartite graphs, shortest paths on dynamic graphs, minimum fundamental cycle bases; kissing numbers. Publications: [110, 6, 119, 9, 120, 123, 10, 12, 11, 22, 132, 21, 98, 27, 29, 20, 96, 136, 130, 82, 141, 99, 43, 36, 47, 50, 39, 41, 42, 51, 52, 54, 60, 61, 63, 72, 74, 86, 88, 89, 91, 102, 157, 172, 173, 174, 179, 180, 181, 182, 184, 185, 186, 187, 188, 189, 64, 194, 195, 197, 198, 201, 208, 210]. Software: minfcb [54]. Patent: [205]. Funding: [10, 14, 26, 27].
- *Distance geometry and bioinformatics*. Protein structure from NMR data, morphogenesis, Hartree-Fock equations. Publications: [76, 111, 2, 5, 3, 117, 116, 118, 115, 8, 125, 13, 129, 10, 131, 17, 18, 79, 94, 95, 32, 96, 139, 140, 37, 23, 24, 31, 146, 143, 148, 151, 34, 152, 35, 159, 46, 44, 45, 55, 57, 62, 65, 73, 106, 108, 162, 163, 167, 168, 170, 175, 177, 178, 191, 192, 209]. Software: branchprune, MD-jeep [159, 209]. Funding: [8, 20, 21, 24].
- *Complex industrial systems*. Applications of optimization to complex systems arising in industry: efficient routing on traffic-dependent road networks, gamma knife configuration, optimization of a biomass production process, optimized platforming, verification of embedded code, recommender systems (and other

subjects). Publications: [112, 3, 6, 113, 114, 4, 9, 120, 123, 122, 124, 127, 128, 16, 14, 11, 81, 136, 28, 137, 141, 142, 149, 150, 155, 154, 156, 51, 58, 59, 60, 104, 160, 171, 173, 180, 182, 185, 187, 190]. Patents: [204, 205]. Funding: [1, 2, 6, 10, 13, 16, 17, 18, 22, 25, 26, 27, 28, 29, 30].

- *Optimization and Sustainable Development*. Research on the application of optimization methods to sustainable development applications: transportation and energy. Publications: [3, 120, 123, 122, 124, 127, 14, 19, 136, 147, 145, 207]. Funding: [3, 13, 9, 7].

## Grants and sponsorships

1. *CISCO Foundation*. Optimal deployment of wireless networks; at LIX, École Polytechnique (PI, 95KUSD, 1 year, started 2017).
2. *Siebel Energy Institute*. Quantile regression in large energy datasets; at LIX, École Polytechnique (PI, 50KUSD, 6 months, started 2017).
3. *PGMO*. Diagonally dominant programming for Optimal power flow problems; at LIX, École Polytechnique (PI, 12KEUR, 1 year, started 2016).
4. *IBM France*. PhD studentship on Business Rules reformulation; at LIX, École Polytechnique (PI, 45KEUR, 3 years, started 2014).
5. *MINO*. Marie-Curie ITN on Mixed-Integer Nonlinear Programming (co-PI for Ecole Polytechnique, 1 Ph.D. fellowship, 4 years, started 2012).
6. *SO Grid*. Development of a “smart meter” for smart electrical grids (workpackage leader, 200KEUR, 3 years, started 2012).
7. *MSR Thesis Grant*. Microsoft Research PhD thesis award about optimization and simulation applied to smart buildings; at LIX, Ecole Polytechnique (PI, 3 years starting 2012, 100KEUR).
8. *Bip:Bip*. ANR project on bioinformatics led by Institut Pasteur (LIX workpackage leader, 119KEUR, 5 years, started 2012).
9. *IFPen*. PhD studentship on black-box MINLP techniques applied to reservoir engineering; at LIX, École Polytechnique (PI, 30KEUR, 3 years, started 2011).
10. *Mediamobile*. PhD studentship on multimodal shortest paths on large dynamic graphs research; at LIX, École Polytechnique (co-PI, 57KEUR, 3 years, started 2009).
11. *EWMINLP10 workshop sponsorship* from IBM and TOTAL, 2010, 6KEUR (co-PI).
12. *ARM*. Digiteo “Emergence” project on Reformulations in Mathematical Programming, 3 years starting sept. 2009, 109KEUR (PI).
13. *OSD*. Microsoft Chair on Sustainable Development, 4 years starting 2009, 540KEUR (co-PI).
14. *CTW09 workshop sponsorship*. Digiteo support for scientific events, 7.5KEUR (PI).
15. *RMNCCO*. Digiteo “Senior Chair” on Reformulations in Mathematical Programming, 4 years starting march 2009, 250KEUR (PI).
16. *ASOPT*. ANR project on software verification, 3 years starting sept. 2008, around 700KEUR (5 partners).
17. *PASO*. Digiteo Emergence project on software verification, 2 years starting july 2008, 110KEUR (4 partners).
18. *FLUCTUAT*. Digiteo OMTE project on software verification, 1 year starting june 2008, around 50KEUR (2 partners).
19. *Digiteo Visiting Professor sponsorship*. Funding for inviting Prof. P. Hansen (GERAD, Canada) at LIX for 6 months in 2008/2009.
20. *X Visiting Professor sponsorship*. Funding for inviting Prof. C. Lavor (UniCamp, Brazil) at LIX for a 2-months period in 2009.
21. *CNRS Visiting Professor sponsorship*. Funding for inviting Prof. C. Lavor (UniCamp, Brazil) at LIX for a 3-months period in 2008.
22. *EDONA*. Paris Region System@tic project, part of Num@tec Automotive, for co-operative R&D in car electronics. Consortium of 19 industrial and academic partners; at LIX, École Polytechnique (PI for LIX Work Package, 56KEUR, 24 months starting 2007).

23. *ARS*. ANR (Agence Nationale de la Recherche) project on Automatic Reformulation Search; at LIX, École Polytechnique (PI for the whole project, 118KEUR, 36 months starting 2007).
24. *Morpheus*. EU project on the transition from genetic to morphological features in living beings: *in silico* simulations; at LIX, École Polytechnique (co-PI for the Work Package in which LIX participates, around 100KEUR, 24 months starting 2007).
25. *Post-doctoral fellowship fundings, complex industrial systems*. A post-doctoral fellowship on the subject of complex industrial systems awarded by the Ile-de-France region; at LIX, École Polytechnique (co-PI, 72KEUR, 18 months starting 2007).
26. *Mediamobile*. PhD studentship on shortest paths on large dynamic graphs research; at LIX, École Polytechnique (PI, 45KEUR, 3 years, starting 2006).
27. *Shortest paths on large dynamic graphs*. Partial real-time traffic information is interpreted as a dynamic (time) cost on a geographical graph representing the French route network. Computing shortest paths in such a graph is a challenging practical problem. This project is industrially sponsored by Mediamobile and organised within the framework of the Chaire Thales, LIX, École Polytechnique (PI, 20KEUR, early 2006).
28. *System@tic/Usine logicielle*. Ile-de-France project for the ParisTech competitiveness pole; focusing on verification and validation of software systems; at LIX, École Polytechnique (scientific adviser, around 120KEUR, 60 months started early 2006).
29. *Complex industrial systems*. A complex industrial system can be seen as a collection of hypergraphs which model all the relationships among the different agents. From this model it is possible to formulate related (nonlinear) scheduling and classification problems. This project is led by Prof. D. KroB (LIX, École Polytechnique) and sponsored by Thales Group (around 1MEUR over 5 years, on the grant 2005-2009).
30. *Biomass-based energy production*. Energy can be produced by processing biomass-based materials, including wasted alimentary fats and unused agricultural products. The planning and running of such an industrial plant requires the use of optimization. This is an industrially sponsored project in collaboration with TechnoPlan, a small Milan firm which received a regional grant for building such plants throughout many Italian regions (co-PI, 30KEUR, 2005-2006).
31. *Ipnos partnership*. Founded in London, UK in 2001, with three partners. Management and design of computer networks. Research and development of B2B paradigm on-line software packages. Net revenue: around 35K GBP / year (co-founder and partner at 45%).
32. *IrisTech s.r.l.*. Founded in Milan, Italy in 2000, with two partners. Website hosting for medium-sized businesses. Net revenue: 50K euro / year. Co-founder and partner at 20% until 2002.

## Prizes

- IBM Faculty Award (nov. 2015).
- “Best of computing” notable article mention awarded by the ACM Computing Reviews’ 19th *Annual Best of Computing* to 17 — awarded<sup>2</sup> to 87 among all papers and books in computing (broadly defined, includes science and technology) published during 2014.
- Co-winner [33] of the best paper award for the Journal of Global Optimization in 2012 (chosen over 140 papers).
- Glover-Klingman prize for the best paper [36] published on the “Networks” journal published by Wiley in 2012 (voted best over 60 papers).
- 2nd position in the “Modularity Clustering Quality Challenge” section of the 10th *DIMACS Implementation Challenge* 2012.
- 2nd “Robert Faure” ROADEF prize 2009 (this is the tri-ennial prize of the French OR society, with three laureates at each edition).
- “Best poster” prize at Digiteo Annual Forum 2008.
- IMA (Institute for Mathematics and Applications) Prize for “exceptional performance” on completion of the B.Sc.

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<sup>2</sup><http://www.computingreviews.com/recommend/bestof/notableitems.cfm?bestYear=2014&more=yes>.

## Administrative responsibilities

- Member of the board of the Doctoral School in Computer Science of the University of Pisa, Italy, 2017-.
- CNRS National Committee Member for Computer Science (nominated to section 6), 2016-.
- Siebel Energy Institute (funding program for energy), campus lead, 2015-.
- Evaluation of projects for Brazil (CNPq), 2015-.
- Member of the Goldstine Fellowship committee (IBM Research), 2013-2014.
- PGM0 (funding program for optimization) scientific committee, 2012-.
- Recruitment/search committee for Rennes University, 2011.
- Vice-president of the Comp. Sci. Department at Ecole Polytechnique, 2010-2012.
- Director of Microsoft-CNRS Chair “Optimization and Sustainable Development”, 2010-2014.
- Founder and head of the “System Modelling and Optimization (SYSMO) research team at LIX, Ecole Polytechnique, 2010-2012.
- Evaluation of projects/researchers for Italy (PRIN/MIUR/ANVUR), 2009-.
- Digiteo (funding agency) program committee, 2008-2009.
- Recruitment/search committee for Paris 6 University, 2007-2010.
- Recruitment/search committee for Paris-Sud University, 2007-2008.
- Recruitment/search committee for LIX, Ecole Polytechnique, 2006-.

## Academic community

- European Doctoral Dissertation Award (EDDA) committee member for 2013.
- INFORMS Optimization Society Vice-president for global optimization, 2013-2015.
- COIN-OR (open-source optimization software) Foundation member since Oct. 2012.
- Referee for many international journals and conferences.

## Editorial responsibilities

- Associate Editor for *Operations Research Letters* – ORL – (Elsevier) since nov. 2013.
- Guest editor with Th. Marchant, S. Martello of a special issue of *Annals of Operations Research*, 2013
- Guest editor with P. Bonami, A. Miller, A. Sartenaer of a special issue of *Mathematical Programming B*, 2012
- Guest editor with S. Caferi, F. Messine of a special issue of *Journal of Global Optimization*, 2012
- Associate Editor for *EURO Journal of Computational Optimization* – JCO – (Springer) since its foundation (2012).
- Associate Editor for *Computational Management Science* – CMS – (Springer) since 2011.
- **Editor-in-Chief** (with S. Martello and T. Marchant) of *4OR* (Springer) 2010-2016. *During my tenure, the journal’s impact factor rose from 0.323 (2011) to 1.371 (2015).*
- Editor of *Discrete Applied Mathematics* – DAM – (Elsevier) since february 2010.
- Guest editor with N. Maculan of a special issue of *Discrete Applied Mathematics* on “Reformulation techniques in Mathematical Programming” (Vol. 157(6), March 2009).
- Associate Editor for *International Transactions in Operational Research* – ITOR – (Wiley) 2007-2016.
- Guest editor with U. Faigle, S. Pickl, F. Maffioli of a special issue of *Discrete Applied Mathematics* (Vol. 155(14), September 2007).
- Guest editor with U. Faigle, S. Pickl, F. Maffioli of a special issue of *Discrete Optimization* (Vol. 3(3), September 2006).
- Associate Editor for *Journal of Global Optimization* – JOGO – (Springer) since September 2006.

## Conference organization

- General chair for CTW 2018.
- Programme Committee member for LAWCG 2018.
- Programme Committee member for FCT 2017.
- Programme Committee member for ROADEF 2017.
- Programme Committee member for GOW 2016.
- General co-chair for the DGTA workshop on Distance Geometry at DIMACS, 2016.
- Programme Committee member for ISCO 2016.
- General co-chair for the Oberwolfach workshop on MINLP 2015.
- Programme Committee member for BIOINFORMATICS 2015.
- Programme Committee member for International Conference on Variable Neighbourhood Search 2014.
- Programme Committee member for BIOINFORMATICS 2014.
- Programme Committee member for ISCO 2014 (LNCS Proceedings).
- Track chair (Global optimization and MINLP) for INFORMS 2013.
- Organizing committee co-chair for CWMINLP 2013.
- Programme Committee member for SEA 2013 (LNCS Proceedings).
- Programme Committee member for ESA 2013 (LNCS Proceedings).
- Track co-chair (Global optimization and MINLP) for ICCOPT 2013.
- Programme Committee co-chair for ATMOS 2012.
- Programme Committee member for the Symposium on Experimental Algorithms (SEA12), 2012 (LNCS Proceedings).
- Programme Committee member for Mini Euro Conference on Variable Neighbourhood Search (MECVNS12), 2012.
- Programme Committee member for MatHeuristics 2012 international workshop.
- Member of the Programme Committee of the Int. Conf. on Op. Res. and Enterprise Systems (ICORES), Algarve 2012.
- Member of the Programme Committee of the European Symposium on Computer Aided Process Engineering (ESCAPE), London 2012.
- Organization of the workshop Pretty Structures 2011 (IHP, Paris, May 2011, with J. Edmonds).
- Track co-chair (Global optimization and MINLP) for EURO 2010.
- Organizing committee co-chair for the Oberwolfach Mini-Workshop “Exploiting Symmetry in Optimization” (Aug. 2010).
- Organizing committee co-chair for CPAIOR 2010 satellite workshop HybridNL.
- Organization of the sixth Optimeo Workshop (Paris, March 2010).
- Organizing committee for CSDM 2010 international conference.
- Programme Committee member for MatHeuristics 2010 international workshop.
- Organizing committee co-chair for TOGO10 international workshop on Global Optimization, August 2010.
- Scientific committee member of the international conference ICOSC2010, July 2010.
- Organizing committee co-chair for EWMINLP10 international workshop on MINLPs, April 2010.
- Local organizing committee chair in CTW09 international workshop on Graphs and Combinatorial Optimization in Paris, France, June 2009.
- Organizing committee co-chair for CPAIOR 2009 satellite workshop BR-OPT.
- Organization of the first Optimeo 2008 Workshop.
- Scientific and local committee of the international workshop CAL07 (Colloque d’Automne du LIX 2007).
- Scientific committee of Cologne-Twente Workshop on Graphs and Combinatorial Optimization (yearly international workshop) since June 2007.
- Scientific committee of the international conference MECVNS on Variable Neighbourhood Search, Tenerife, Spain, 2005.

- Local organizing committee member in CTW04 international workshop on Graphs and Combinatorial Optimization in Menaggio, Italy, 2004. Co-editor of the Conference Proceedings (published in the Electronic Notes in Applied Mathematics **17**, Elsevier 2004).

### Conference attendance

- MOMI17, Applied-Industrial Mathematics Workshop/PhD. School, Sophia-Antipolis, France, Feb. 2017. **Plenary speaker.**
- AUSSOIS17, Combinatorial Optimization Workshop, Aussois, France, Jan. 2017. **Plenary speaker.**
- DGD16, Rennes, France, Dec. 2016. **Plenary speaker.**
- INFORMS16, Nashville, USA, Nov. 2016.
- GOW16, Braga, Portugal, Sept. 2016.
- ICCOPT16, Tokyo, Japan, August 2016.
- DGTA16, DIMACS, NJ, USA, July 2016. **Co-chair.**
- GeometricRig16, IMCS, Edinburgh, UK, June 2016. **Invited speaker.**
- ECCO16, Budapest, Hungary, May 2016. **Plenary speaker.**
- CTW16, Gargnano, Italy, June 2016.
- ISCO16, Vietri, Italy, May 2016.
- IWAASS16, Rio de Janeiro, Brazil, March 2016. **Invited speaker.**
- IWOBIP16, Monterrey, Mexico, March 2016. **Plenary speaker.**
- AUSSOIS16 Combinatorial Optimization Workshop, Aussois, France, Jan. 2016. **Invited speaker.**
- INFORMS15, Philadelphia, USA, Nov. 2016.
- Oberwolfach workshop on MINLP, Germany, October 2015. **Co-chair.**
- AIRO15, Pisa, Italy, September 2015. **Plenary speaker.**
- JPOC9, Le Havre, France, June 2015. **Plenary speaker.**
- MIP15, Chicago, USA, June 2015. **Invited speaker.**
- ECCO15, Catania, Italy, May 2015. *Session chair.*
- EWGLA15, Budapest, Hungary, May 2015. **Plenary speaker.**
- MINLP15, Sevilla, Spain, March 2015. **Invited speaker.**
- Many Faces of Distances, Campinas, Brazil, October 2014. **Plenary speaker.**
- MAGO14, Global Optimization Workshop, Sept. 2014. **Invited speaker.**
- ICM14, Seoul, South Korea, August 2014. *Session chair.*
- IFORS14, Barcelona, Spain, July 2014. *Session chair.*
- CMU-MINLP Workshop, Pittsburgh, USA, June 2014. **Invited speaker.**
- SIAM14 Optimization Conference, San Diego, USA, May 2014.
- IOS14 INFORMS Optimization Society conference, Houston, USA, Mar. 2014.
- GOR on Deterministic Global Optimization, Dec. 2013. **Invited speaker.**
- OSE13, Turku, Finland, Nov. 2013. **Plenary speaker.**
- INFORMS13, Minneapolis, USA, Oct. 2013 *Track organizer.*
- DGA13, Manaus, Brazil, June 2013. **Plenary speaker.**
- CLAIO/SBPO, Rio de Janeiro, Brazil, Sept. 2012.
- PGMO, Paris, France, Sept. 2012. **Invited speaker.**
- ISMP12, Berlin, Germany, August 2012. *Session chair.*
- GOW12, Natal, Brazil, June 2012. **Plenary speaker.**
- GSC12, Univ. d'Artois, France, June 2012 **Plenary speaker.**
- CTW12, Munich, Germany, May 2012. *Session chair.*
- LION6, Paris, Jan. 2012 **Plenary speaker.**
- AUSSOIS12 Combinatorial Optimization Workshop, Aussois, France, Jan. 2012.

- INFORMS11, Charlotte, Nov. 2011.
- BALCOR11, Thessaloniki, Greece, Sept. 2011 **Plenary speaker**.
- MIP11, Waterloo, Canada, June 2011 **Invited speaker**.
- CTW11, Frascati, Italy, June 2011.
- HybridNL11 (satellite workshop to CPAIOR11), Berlin, Germany, May 2011 **Plenary speaker**
- Pretty Structures 2011, Paris, France, May 2011 **Invited speaker**.
- AUSSOIS11 Combinatorial Optimization Workshop, Aussois, France, Jan. 2011. **Invited speaker**.
- ORBEL10, Ghent, Belgium, Feb. 2011 **Plenary speaker**.
- COCOA10, Kona, USA, Dec. 2010.
- ewMINLP-Seville, Seville, Spain, Dec. 2010 **Invited speaker**.
- ICMS10, Kobe, Japan, Sept. 2010.
- TOGO10, Toulouse, France, August 2010. **Co-chair**.
- OPTSYM10, Oberwolfach, Germany, August 2010. **Co-chair**.
- ICCOPT10, Santiago, Chile, July 2010.
- EURO10, Lisbon, Portugal, July 2010. *Track organizer*.
- ALIO/INFORMS10, Buenos Aires, Argentina, June 2010.
- CTW10, Köln, Germany, May 2010.
- SEA10, Ischia, Italy, May 2010.
- EWMINLP10, Marseille, France, April 2010. **Co-chair**.
- JFRO10, Paris, France, March 2010. **Plenary speaker**.
- ROADEF10, Toulouse, France, Feb. 2010.
- AUSSOIS10 Combinatorial Optimization Workshop, Aussois, France, Jan. 2010. **Invited speaker**.
- SOBRAPO09 Brazilian OR conference, Bahia, Brazil, Sept. 2009. **Plenary speaker**.
- ISMP09 Conference, Chicago, USA, August 2009. *Session chair*.
- MOPTA09 Conference, Lehigh, USA, August 2009.
- IFIP09 Conference, Buenos Aires, Argentina, July 2009. **Plenary speaker**.
- JPOC6 Workshop, Bordeaux, France, June 2009. **Plenary speaker**.
- CTW09, Paris, France, June 2009. **Chair**.
- CIMINLP Workshop, Bordeaux, France, March 2009. **Invited speaker**.
- IMA MINLP Conference, Minneapolis, USA, Nov. 2008. **Invited speaker**.
- COCOA08, St. John's, Canada, Aug. 2008.
- SAGO08, Kruger Park, South Africa, July 2008.
- AAIM08, Shanghai, China, June 2008.
- CTW08, Gargnano, Italy, May 2008.
- NCP07, Rouen, France, Dec. 2007.
- INFORMS07, Seattle, USA, Nov. 2007.
- CTW07, Enschede, The Netherlands, May 2007. *Session chair*.
- ISMP06, Rio de Janeiro, Brazil, Aug. 2006. *Session chair*.
- EURO06, Reykjavik, Iceland, July 2006. *Session chair*.
- ROADEF, Lille, France, Feb. 2006.
- MEC VNS, Tenerife, Spain, Nov. 2005. *Session chair*.
- EURO-ALIO 2005, Paris, France, Oct. 2005.
- GO05, Almeria, Spain, Sept. 2005.
- AIRO05, Camerino, Italy, Sept. 2005. *Session chair*.
- AIRO04, Lecce, Italy, Sept. 2004.
- COLOQUIO SMP, Lima, Peru, July 2004. **Plenary speaker**.
- ERICE04, Erice, Italy, June 2004.
- CTW04, Menaggio, Italy, June 2004. *Session chair*.



- SYM-OP-IS, Herceg-Novci, Serbia and Montenegro, Oct. 2003.
- ICOOC, Ulaanbaatar, Mongolia, Aug. 2002. *Session chair*.
- IFORS Conference, Edinburgh, UK July 2002.
- SIAM Conference on Optimization, Toronto, Canada, May 2002.

### Visiting terms and seminars

- Dept. of Automatic and Management Engineering (DIAG), Univ. di Roma “La Sapienza”, Italy (2017, 1 seminar, invited by Laura Palagi).
- School of Economics, Univ. di Roma “La Sapienza”, Italy (2017, 1 month visiting professorship, invited by Fabio Tardella).
- Dept. of Comp. Sci., Pontificia Universidade Católica (PUC), Rio de Janeiro, Brazil (2017, 1 seminar, invited by Thibaut Vidal).
- Instituto de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil (2017, 1 week, invited by Claudia Sagastizábal).
- Dept. of Mathematics, Queen Mary University of London (QMUL), UK (2017, 1 seminar, invited by Bill Jackson).
- ISE, University of Washington, Seattle, USA (2016, 1 seminar, invited by Zelda Zabinski).
- POC seminar, Paris, France (2016, 1 seminar, invited by Mourad Baiou).
- MEMOTEF, Università “La Sapienza”, Rome, Italy (2016, 1 seminar, invited by Fabio Tardella).
- AVT, RWTH Aachen, Germany (2016, 1 seminar, invited by Alexander Mitsos).
- IEOR, Columbia University, USA (2015, 1 seminar, invited by Dan Bienstock).
- IBM TJ Watson Research Center, USA (2015, 1 seminar, invited by Sanjeeb Dash).
- Yahoo! Labs, USA (2015, 1 seminar, invited by Edo Liberty).
- DIMACS, Rutgers University, USA (2015, 1 month, co-sponsored by DIMACS).
- LIPN, Université Paris 13 (2015, 1 seminar, invited by Roberto Wolfler).
- University of Tokyo, Japan (2015, 1 seminar, invited by Hiroshi Imai and JFLI).
- IMECC, University of Campinas (SP), Brazil (2015, 2 months, visiting chair under *Chaires Françaises dans l'état de São Paulo*).
- Instituto Nacional de Matemática Pura e Aplicada (IMPA), Rio de Janeiro, Brazil (2015, 1 week, invited by Mikhail Solodov).
- Paris Research Center, Huawei (2015, 1 seminar, invited by Amaya Nogales-Gomez).
- CPSE, Imperial College London (2015, 1 seminar, invited by Ruth Misener).
- FranceLab, IBM (2015, 1 seminar, invited by Christian de Sainte-Marie).
- Operations Research and Financial Engineering, Princeton University (2015, 1 seminar, invited by Amir Ali Ahmadi).
- Chemical Engineering, MIT (2014, 1 seminar, invited by Paul Barton).
- Chemical Engineering, Carnegie-Mellon university (2014, 1 seminar, invited by Nikolaos Sahinidis).
- GERAD, Montreal (2013, 1 week, invited by Pierre Hansen).
- Lehigh University (2013, 1 seminar, invited by Ted Ralphs).
- Rutgers University (2013, 1 seminar, invited by Farid Alizadeh).
- New York University (2013, 1 seminar, invited by Michael Pinedo).
- Singapore University of Technology and Design (2013, 1 week, invited by Giacomo Nannicini).
- DIIGA, Università Politecnica delle Marche (2012, 1 seminar, invited by Fabrizio Marinelli).
- Comp. Sci. Dept., IIT Delhi (2012, 1 seminar, invited by Naveen Garg).
- LIPN, Université Paris 13 (2011, 1 seminar, invited by R. Wolfler Calvo).
- COPPE, Universidade Federal do Rio de Janeiro; and IMECC, Universidade Estadual de Campinas (2011, 1 month, 2 seminars, invited by N. Maculan and C. Lavor).
- CERFACS, Toulouse, France (2010, 1 seminar, invited by A. Mucherino).

- IMECC-Universidade do Estado de Campinas, São Paulo, Brazil (2010, 1 week, invited by C. Lavor).
- Tepper School of Business, Carnegie-Mellon University (2009, 1 seminar in the Tepper Research Seminar series).
- Chemical Engineering, Carnegie-Mellon University (2009, 1 seminar, invited by I. Grossmann).
- Gaz de France, Paris (2008, 1 seminar, invited by M.C. Plateau)
- T.J. Watson IBM Research Center, Yorktown Heights (2007, 1 seminar, invited by J. Lee).
- LIF, Université de Marseille à Luminy (2007, 1 seminar, invited by G. Cornuéjols).
- Università di Roma “La Sapienza” (2007, 1 seminar, invited by G. Patrizi).
- PRISM, Université de Versailles (2007, 1 seminar, invited by I. Tseveendorj).
- LAMSADE, Université Paris IX - Dauphine (2006, 1 seminar, invited by V. Paschos).
- LIAFA, Université Paris 6 (2006, 1 seminar, invited by M. Habib).
- COPPE, Universidade Federal do Rio de Janeiro (2006, 1 month, invited by N. Maculan).
- LINA, Université de Nantes (2006, 1 seminar, invited by X. Gandibleux).
- LRI, Université Paris 11 (2006, 1 seminar, invited by B. Rozoy).
- LIP6, Université Paris 6 (2006, 1 seminar, invited by F. Sourd).
- Conservatoire National d’Arts et Métiers (2006, 1 seminar, invited by A. Billionnet).
- LIPN, Université Paris 13 (2006, 1 seminar, invited by G. Plateau).
- Università degli Studi di Milano (2005, seminar, invited by M. Trubian).
- Academy of Sciences of Belgrade (2003-2004, 4 times, 1 week each time, 6 seminars, invited by N. Mladenović).
- COPPE, Universidade Federal do Rio de Janeiro (2004, 1 month, invited by N. Maculan).
- Universidade do Estado do Rio de Janeiro (2004, 2 weeks, invited by C. Lavor).
- Universidad de Lima (2004, 1 week, invited by W. Sosa).
- Politecnico di Milano (2001-2002, twice, 2 seminars, invited by E. Amaldi).
- Università di Torino (2001, 1 seminar, invited by M. Locatelli).
- Università di Firenze (2001, 1 seminar, invited by F. Schoen).
- Università di Pisa (2001, 1 seminar, invited by G. Gallo).

## Teaching experience

*Note:* The teaching material for the courses can be downloaded from <http://www.lix.polytechnique.fr/~liberti/teaching>.

### 1. Administrative responsibilities.

- Co-organizer of the “Master Parisien en Recherche Operationnelle” (MPRO — Paris Master in OR), 2011-2012.
- Vice-president of the Computer Science Department at Ecole Polytechnique, 2010-2012.
- Co-organizer of the specialization “Optimization, Communication, Signal” with F. Bonnans, 2008-2009.

### 2. Courses taught

- **Mathematical Programming.** Given at DIX, École Polytechnique. Level: M.Sc.
- **Data Science.** Given at DIX, École Polytechnique, assistant to F. Nielsen. 260 students. Exercises: 32h. Level: B.Sc.
- **Distance Geometry.** Graduate-level mini-course given at: (a) MFD14 workshop at the University of Campinas (Brazil) in 2014, (b) LIX Ecole Polytechnique in 2015, (c) Institut Pasteur in 2015, (d) Columbia University in 2015. 40 students. Lectures: 4.5-9h. Level: M.Sc., Ph.D. and over.
- **Natural Language Processing.** A mini-course about IBM Watson Technologies, given at LIX Ecole Polytechnique in 2015. 20 students. Lectures: 9h. Level: B.Sc., M.Sc., Ph.D.
- **Advanced Mathematical Programming.** Given within the MPRO programme, Conservatoire National d’Arts et Métiers. 15 students. Lectures: 8h. Level: M.Sc.

- **Operations Research and Sustainable Development.** Given within the MPRO programme, Conservatoire National d'Arts et Métiers. 15 students. Lectures: 8h. Level: M.Sc.
- **Fundamentals of programming and algorithms,** Given at DIX, École Polytechnique, 2 times. 250 students, Lectures: 18h. Course level: B.Sc.
- **Algorithms, Networks, Languages.** Given at DIX, École Polytechnique, assistant to B. Werner. Lectures and exercises: 12h. Level: B.Sc.
- **Software engineering.** Given at DIX, École Polytechnique, 4 times, with D. Krob. Course level: M.Sc.
- **Optimization: Modelling and Software.** Given at DIX, École Polytechnique, 3 times. Course level: M.Sc.
- **Operations Research.** Given at DIX, École Polytechnique, for the Master "Ingénierie de Systèmes Industriels Complexes" (ISIC), 3 times. Course level: M.Sc.
- **Scheduling, linear programming and network flows.** Given at Paris VI University for the "Master Parisien en Recherche Informatique" (MPRI), 1st semester 2006-2007, 2007-2008 with C. Dürr and Ph. Baptiste. 35 students. Course level: M.Sc.
- **Introduction to C++ (Online).** For DIX/DMAP, École Polytechnique.
- **Introduction to C++.** Given at DMAP, École Polytechnique, 6 times. Course level: B.Sc.
- **Introduction to C++ for Java Users.** Given at DIX, École Polytechnique, 4 times. Course level: B.Sc.
- **Principles of Programming Languages.** Given at DIX, École Polytechnique, 2nd semester 2005-2006. Assistant to G. Dowek. 180 students. 40 hours computer lab (Java). Course level: B.Sc.
- **Constraints and combinatorics.** Given at DIX, École Polytechnique, II semester 2005-2006, with Ph. Baptiste. 20 students. 3 hours lecture, 3 hours computer lab (CPLEX). Course level: M.Sc.
- **Fundamental Computer Science.** End-of-course project for the course INF431 given at DIX, École Polytechnique, II semester 2005-2006.
- **Advanced Operations Research.** Given at Politecnico di Milano, II semester 2004-2005. Assistant to E. Amaldi. 50 students. 14 hours lecture, 10 hours computer lab (MatLab). *Syllabus:* Convexity, nonlinear optimisation models, unconstrained and constrained nonlinear optimisation algorithms, saddle point theory. I had a substantial part in planning the course contents. Course level: M.Sc.
- **Fundamentals of Operations Research.** Given 6 times at Politecnico di Milano (campus Milano and campus Como) as assistant to two professors:
  - E. Amaldi. *Syllabus:* Graph theory (trees, paths, networks) linear optimisation (models, simplex algorithm, duality), combinatorial optimisation (models, cutting plane, branch-and-bound).
  - F. Malucelli. *Syllabus:* Graph theory (trees, paths, networks) linear optimisation (models, simplex algorithm, duality), combinatorial optimisation (models, cutting plane, branch-and-bound, heuristics).
- (a) I semester 2004-2005. Assistant to F. Malucelli. 150 students. Lectures: 4 hours. Computer labs: 20 heures (AMPL). Course level: B.Sc.
- (b) I semester 2004-2005. Assistant to E. Amaldi. 200 students. Lectures: 14 hours. Computer labs: 10 hours (AMPL). Course level: M.Sc.
- (c) II semester 2003-2004. Assistant to E. Amaldi. 100 students. Lectures: 14 hours. Computer labs: 10 heures (AMPL). Course level: B.Sc.
- (d) I semester 2003-2004. Assistant to F. Malucelli. 150 students. Lectures: 4 hours. Computer labs: 20 hours (XPress-MP). Course level: M.Sc.
- (e) I semester 2003-2004. Assistant to E. Amaldi. 150 students. Lectures: 12 hours. Computer labs: 12 hours (AMPL). Course level: B.Sc.
- (f) II semester 2002-2003. Assistant to E. Amaldi. 100 students. Lectures: 14 hours. Computer labs: 10 hours (AMPL). Course level: B.Sc.
- **Global optimization.** Mini-course given at Lima University in July 2004. 30 students. Lectures: 9 hours. *Syllabus:* Nonlinear models, main local nonlinear optimisation methods, algorithms in global optimisation. Material: monograph "Introduction to Global Optimization" published by SMP Press, Lima 2004. Course level: M.Sc. and Ph.D.
- **Introduction to C++.** Given at Imperial College London during the II semester 2001-2002. Assistant to C. Pantelides. 100 students. Lectures: 4 hours. Computer labs: 12 hours (Visual C++). *Syllabus:* C++ Syntax, examples, data structures, classes, inheritance, software architecture. Course level: B.Sc.

- **Using the computer.** Given three times to the personnel of my regiment (Engineer Corps) during the military service, sept/oct 1998. Sponsored by the European Project “Euroformazione Difesa”. Each edition of the course had 30 students, 10 hours of lessons and 10 hours of computer labs. *Syllabus*: Using Windows and Office. Course level: secondary school. I was also the main administrative liaison between the Regiment, the Defence Ministry Office and the supporting professional institute.
- **Design and implementation of websites.** Given at the CSEA professional institute (Turin, Italy) in January 1998. 20 students. Lessons: 10 hours. Computer labs: 10 hours. *Syllabus*: Server-client communication model, HTTP protocol, syntax, introduction to dynamic websites. Course level: professional course for B.Sc. graduates.
- **Introduction to logic.** Given at the CSEA professional institute (Turin, Italy) in november 1997. 30 students. Lessons: 25 hours. *Syllabus*: boolean logic. Course level: professional course for people with A-levels.
- **Operating systems.** Given at the CSEA professional institute (Turin, Italy) in october 1997. 40 students. Lessons: 20 hours. Computer labs: 10 hours (Linux). *Syllabus*: taxonomy of operating systems, introduction to unix-like OSes, installation of Linux. Course level: professional course for people with A-levels.
- **Introduction to the computer.** Given at the CSEA professional institute (Turin, Italy) in september 1997. 40 students. Lessons: 20 hours. Computer labs: 10 hours. *Syllabus*: DOS, Logo, Basic. Course level: professional course for people with A-levels.

## Supervision and tutoring

- **2017**: Supervision of the M.Sc. thesis of Gabriele Iommazzo. Topic: (Machine) Learning to solve Hydro Unit Commitment problems.
- **2017**: Supervision of the M.Sc. thesis of Esteban Salgado. Topic: Diagonally Dominant Programming for the AC Optimal Power Flow problem.
- **December 2014**: Referee for Seppo Pulkkinen’s Ph.D. thesis (University of Turku, Finland).
- **Since June 2014**: Supervision of the Ph.D. thesis of Olivier Wang. Topic: automatic reformulation of Business Rules programs.
- **2014-2016**: Co-supervision (with C. D’Ambrosio and A. Frangioni) of part of the Ph.D. thesis of Kostas Tavlaridis-Gyparakis. Topic: the Unit Commitment Problem in the energy industry.
- **2014-2016**: Postdoctoral supervision of P.-L. Poirion. Topic: Optimal observability of the state of a smart-grid.
- **2014-2016**: Postdoctoral supervision of S. Toubaline. Topic: Optimal observability of the state of a smart-grid.
- **2013-2016**: Co-supervision (with C. D’Ambrosio) of the Ph.D. thesis of Youcef Sahraoui. Topic: Optimization problems arising from hydroelectric generating plants.
- **Since Sept. 2013**: Co-supervision (with C. D’Ambrosio) of the Ph.D. thesis of Luca Mencarelli. Topic: Mixed-Integer Nonlinear Programming.
- **2012-2016**: Co-supervision (with Y. Hamadi) of the Ph.D. thesis of Vu Khac Ky. Topic: optimization techniques for “smart buildings”.
- **Since November 2012**: Co-supervision (with N. Maculan) of the Ph.D. thesis of G. Dias. Topic: reformulations in mathematical programming.
- **2012-2014**: Postdoctoral supervision of A. Cassioli. Topic: Distance geometry techniques in molecular conformation.
- **July 2012**: Referee for Pete Janes’ Ph.D. thesis (Australian National University).
- **June 2012**: Referee for Mohammed Alfaki’s Ph.D. thesis (Bergen University, Norway).
- **2011-2015**: Supervision of the Ph.D. thesis of C. Lizon. Topic: black-box MINLP methods applied to reservoir engineering.
- **2010-2012**: Postdoctoral supervision of H. Hijazi. Topic: Global optimization and mathematical programming in software verification.

- **2010-2011:** Postdoctoral co-supervision of D. Brockhoff. Topic: preferences in multiobjective optimization.
- **2010-2011:** Postdoctoral co-supervision of A. Fialho. Topic: automatic configuration of complex algorithms.
- **2010-2013:** Co-supervision (with P. Hansen) of the Ph.D. thesis of C. Lucas. Topic: Spectral graph theory.
- **2010-2012:** Postdoctoral supervision of N. Touati. Topic: multiobjective optimization and routing of hazardous materials.
- **2010-2013:** Co-supervision (with R. Wolfler Calvo) of the Ph.D. thesis of D. Kirchler. Topic: multiobjective multimodal shortest paths on road networks.
- **November 2009:** Referee for Andreas Lundell's Ph.D. thesis (Åbo University, Finland).
- **2009-2012:** Supervision of the Ph.D. thesis of A. Costa. Topic: reformulations in mathematical programming.
- **September 2009:** Member of the Ph.D. awarding committee for Makhlouf Hadji (Telecom SudParis and Paris 6).
- **2009-2013:** Supervision of the Ph.D. thesis of F. Roda. Topic: multiobjective optimization.
- **October 2008:** Member of the Ph.D. awarding committee for Ronald Zumkeller (École Polytechnique).
- **October 2008:** Member of the Ph.D. awarding committee for Cheikh Brahim Ould El Mounir (Amiens University).
- **2008-2010:** Post-doctoral supervision of A. Mucherino. Topic: Clustering.
- **2008:** Supervision of M.Sc. research stage (year 1) of J. Leconte. Topic: Optimization techniques for static code analysis.
- **2008-2009:** Post-doctoral supervision of S. Cafieri. Topic: Reformulation techniques in mathematical programming.
- **2008:** Co-supervision (with E. Amaldi) of K. Dhyani's PhD thesis (internship at LIX, École Polytechnique). Topic: Hyperplane Clustering Problem.
- **2007-2008:** Post-doctoral supervision of L. Di Giacomo. Topics: Platforming, An LCP-based IP heuristic.
- **2007-2009:** Post-doctoral supervision of F. Tarissan. Topic: Optimization techniques for bioinformatics problems, Reformulation techniques.
- **September 2006:** Member of the Ph.D. awarding committee for Lydia Gastal (LRI, Orsay).
- **2007:** Supervision of ISIC Master students L. Rosero et A. Perciu. Topic: Modelling techniques in system architecture.
- **2007:** Post-doctoral supervision of F. Marinelli. Topic: Platforming, Optimization techniques in static analysis of code.
- **2006-2009:** Supervision of the Ph.D. thesis of G. Nannicini. Topic: Shortest paths on large stochastic networks.
- **November 2006:** Member of the Ph.D. awarding committee for Marie-Christine Plateau (CNAM, Paris).
- **October 2006:** Post-doctoral supervision of P. Belotti.
- **Decembre 2005:** Co-supervision (with P. Baptiste) of the Ph.D. thesis of C. Gwiggner. Topic: Air traffic.
- **Septembre 2005:** Co-supervision (with E. Amaldi) of the Ph.D. minor of M. Sykora. Topic: Cycle bases.
- **August 2005:** Mini-project<sup>3</sup> by R. Villa. Topic: Scheduling with communication delays.
- **July 2005:** Mini-project by C. Brescia. Topic: Scheduling with communication delays.
- **July 2005:** Co-supervision (with E. Amaldi) of the M.Sc. thesis of A. Chiapparini. Topic: Cycle bases.
- **May 2005:** Co-supervision (with F. Malucelli) of the M.Sc. thesis of A. Pastino. Topic: Localization of wireless hubs for gas-meter networks.
- **December 2004:** Mini-project by S. Coniglio, F. Italiano, A. Tagliasacchi. Topic: Cycle bases.
- **May 2004:** Mini-project by F. Cerretti, D. Vanoni. Topic: Tree enumeration.

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<sup>3</sup>These are projects of the duration of 2-4 months for B.Sc. students.

- **March 2004:** Mini-project by S. Galli. Topic: Global optimization software interfacing with AMPL.
- **January 2004:** Mini-project by A. Omassi. Topic: Report on the linear solver CLP.

### Computer-related skills

- Excellent mastering of Optimization Systems and Software: CPLEX, XPRESSMP, AMPL, SNOPT, MINOS, GLPK and many others, both commercial and free.
- Excellent mastering of C/C++/Fortran programming in large-scale software projects; integration of different software modules, written in different programming languages, under a unified software framework; rational API design and implementation.
- Excellent mastering of Unix systems (Linux, Solaris, IRIX, Tru64), good knowledge of Windows operating systems.

### Languages

- Italian: mother tongue.
- English: excellent spoken and written.
- French: excellent spoken and written.
- Portuguese: basic.

### List of publications

- INTERNATIONAL JOURNALS:
  1. M. Fischetti, **L. Liberti**, D. Salvagnin, T. Walsh, *Orbital Shrinking: Theory and Applications*, Discrete Applied Mathematics, accepted.
  2. D. Gonçalves, A. Mucherino, C. Lavor, **L. Liberti**, *Recent advances on the interval distance geometry problem*, Journal of Global Optimization, accepted.
  3. L. Mencarelli, Y. Sahraoui, **L. Liberti**, *A multiplicative weights update algorithm for MINLP*, EURO Journal on Computational Optimization, **5**:31-86, 2017.
  4. Vu Khac Ky, C. D'Ambrosio, Y. Hamadi, **L. Liberti**, *Surrogate-based methods for black-box optimization*, International Transactions in Operational Research, **24**(3):393-424, 2017.
  5. C. D'Ambrosio, K. Vu, C. Lavor, **L. Liberti**, N. Maculan, *New error measures and methods for realizing protein graphs from distance data*, Discrete and Computational Geometry, **57**(2):371-418, 2017.
  6. P.-L. Poirion, S. Toubaline, C. D'Ambrosio, **L. Liberti**, *The Power Edge Set problem*, Networks, **68**(2):104-120, 2016.
  7. H. Hijazi, **L. Liberti**, *Constraint Qualification Failure in Action*, Operations Research Letters, **44**(4):503-506, 2016.
  8. **L. Liberti**, C. Lavor, *Six mathematical gems from the history of Distance Geometry*, International Transactions in Operational Research (special issue on Distance Geometry), **23**:897-920, 2016.
  9. A. Costa, S. Kushnarev, **L. Liberti**, S. Zeyu, *Divisive Heuristic for modularity density maximization*, Computers and Operations Research, **71**:100-109, 2016.
  10. A. Cassioli, O. Günlük, C. Lavor, **L. Liberti**, *Discretization vertex orders in distance geometry*, Discrete Applied Mathematics, **197**:27-41, 2015.
  11. D. Kirchler, **L. Liberti**, R. Wolfler Calvo, *Efficient Computation of Shortest Paths in Time-Dependent Multi-Modal Networks*, ACM Journal of Experimental Algorithmics, **19**:1-29, 2015.
  12. A. Bettinelli, Pierre Hansen, **L. Liberti**, *Community detection with the weighted parsimony criterion*, Journal of Systems Science and Complexity, **28**(3):517-545, 2015.
  13. A. Cassioli, B. Bardiaux, G. Bouvier, A. Mucherino, R. Alves, **L. Liberti**, M. Nilges, C. Lavor, T. Malliavin, *An algorithm to enumerate all possible protein conformations verifying a set of distance constraints*, BMC Bioinformatics, 16:23, 2015.

14. **L. Liberti**, *Optimization and Sustainable Development*, Computational Management Science, **12**(3):371-395, 2015.
15. **L. Liberti**, J. Ostrowski, *Stabilizer-based symmetry breaking constraints for mathematical programs*, Journal of Global Optimization, **60**:183-194, 2014.
16. **L. Liberti**, F. Marinelli, *Mathematical Programming: Turing completeness and applications to software analysis*, Journal of Combinatorial Optimization, **28**:82-104, 2014.
17. **L. Liberti**, C. Lavor, N. Maculan, A. Mucherino, *Euclidean distance geometry and applications*, SIAM Review, **56**(1):3-69, 2014.
18. **L. Liberti**, B. Masson, J. Lee, C. Lavor, A. Mucherino, *On the number of realizations of certain Henneberg graphs arising in protein conformation*, Discrete Applied Mathematics, **165**:213-232, 2014.
19. I. Fernandes, D. Aloise, D.J. Aloise, P. Hansen, **L. Liberti**, *On the Weber facility location problem with limited distances and side constraints*, Optimization Letters, **8**(2):407-424, 2014.
20. S. Cafieri, P. Hansen, **L. Liberti**, *Improving heuristics for network modularity maximization using an exact algorithm*, Discrete Applied Mathematics, **163**:65-72, 2014.
21. A. Bettinelli, **L. Liberti**, F. Raimondi, D. Savourey, *The anonymous subgraph problem*, Computers & Operations Research, **40**:973-979, 2013.
22. E. Amaldi, K. Dhyani, **L. Liberti**, *A two-phase heuristic for the bottleneck  $k$ -hyperplane clustering problem*, Computational Optimization and Applications, **56**:619-633, 2013.
23. C. Lavor, **L. Liberti**, A. Mucherino, *The interval Branch-and-Prune algorithm for the Discretizable Molecular Distance Geometry Problem with inexact distances*, Journal of Global Optimization, **56**:855-871, 2013.
24. S. Sallaume, S. Martins, L. Satoru Ochi, W. Gramacho, C. Lavor, **L. Liberti**, *A discrete search algorithm for finding the structure of protein backbones and side chains*, International Journal of Bioinformatics Research and Applications, **9**:261-270, 2013.
25. S. Cafieri, **L. Liberti**, F. Messine, B. Nogarede, *Optimal Design of Electrical Machines: Mathematical Programming Formulations*, COMPEL: The International Journal for Computation and Mathematics in Electrical and Electronic Engineering, **32**(3):977-996, 2013.
26. A. Costa, P. Hansen, **L. Liberti**, *On the impact of symmetry-breaking constraints on spatial Branch-and-Bound for circle packing in a square*, Discrete Applied Mathematics, **161**:96-106, 2013.
27. A. Bettinelli, P. Hansen, **L. Liberti**, *Algorithm for parametric communities detection in networks*, Physical Review E, **86**:016107, 2012.
28. V. Giakoumakis, D. Krob, **L. Liberti**, F. Roda, *Technological architecture evolutions of information systems: trade-off and optimization*, Concurrent Engineering Research and Applications, **20**(2):127-147, 2012.
29. J. Lee, **L. Liberti**, *A matroid view of key theorems for edge-swapping algorithms*, Mathematical Methods of Operations Research, **76**:125-127, 2012.
30. C. D'Ambrosio, A. Frangioni, **L. Liberti**, A. Lodi, *A storm of Feasibility Pumps for Nonconvex MINLP*, Mathematical Programming B, **136**:229-231, 2012.
31. A. Mucherino, C. Lavor, **L. Liberti**, *The discretizable distance geometry problem*, Optimization Letters, **6**(8):1671-1686, 2012.
32. A. Mucherino, C. Lavor, **L. Liberti**, *Exploiting symmetry properties of the Discretizable Molecular Distance Geometry Problem*, Journal of Bioinformatics and Computational Biology, **10**(3):1242009(15), 2012.
33. H. Sherali, E. Dalkiran, **L. Liberti**, *Reduced RLT representations for nonconvex polynomial programming problems*, Journal of Global Optimization, **52**:447-469, 2012.
34. C. Lavor, **L. Liberti**, N. Maculan, A. Mucherino, *The discretizable molecular distance geometry problem*, Computational Optimization and Applications, **52**:115-146, 2012.
35. C. Lavor, J. Lee, A. Lee-St. John, **L. Liberti**, A. Mucherino, M. Sviridenko, *Discretization orders for distance geometry problems*, Optimization Letters, **6**:783-796, 2012.
36. G. Nannicini, D. Dellling, D. Schultes, **Leo Liberti**, *Bidirectional  $A^*$  search on time-dependent road networks*, Networks, **59**(2):240-251, 2012.
37. C. Lavor, **L. Liberti**, N. Maculan, A. Mucherino, *Recent advances on the discretizable molecular distance geometry problem*, European Journal of Operational Research, **219**:698-706, 2012.
38. **L. Liberti**, *Reformulations in Mathematical Programming: Automatic symmetry detection and exploitation*, Mathematical Programming A, **131**:273-304, 2012.

39. D. Aloise, P. Hansen, **L. Liberti**, *An improved column generation algorithm for minimum sum-of-squares clustering*, Mathematical Programming A, **131**:195-220, 2012.
40. **L. Liberti**, N. Mladenović, G. Nannicini, *A recipe for finding good solutions to MINLPs*, Mathematical Programming Computation, **3**:349-390, 2011.
41. G. Cornuéjols, **L. Liberti**, G. Nannicini, *Improved strategies for branching on general disjunctions*, Mathematical Programming A, **130**:225-247, 2011.
42. **L. Liberti**, L. Alfandari, M.-C. Plateau, *Edge cover by connected bipartite subgraphs*, Annals of Operations Research, **188**(1):307-329, 2011.
43. S. Cafieri, P. Hansen, **L. Liberti**, *Locally optimal heuristic for modularity maximization of networks*, Physical Review E, **83**:056105(1-8), 2011.
44. C. Lavor, A. Mucherino, **L. Liberti**, N. Maculan, *On the computation of protein backbones by using artificial backbones of hydrogens*, Journal of Global Optimization, **50**:329-344, 2011.
45. **L. Liberti**, C. Lavor, A. Mucherino, N. Maculan, *Molecular distance geometry methods: from continuous to discrete*, International Transactions in Operational Research, **18**:33-51, 2010.
46. C. Lavor, A. Mucherino, **L. Liberti**, N. Maculan, *Discrete approaches for solving molecular distance geometry problems using NMR data*, International Journal of Computational Bioscience, **2010**:88-94, 2010.
47. D. Aloise, S. Cafieri, G. Caporossi, P. Hansen, S. Perron, **L. Liberti**, *Column generation algorithms for exact modularity maximization in networks*, Physical Review E, **82**(4):046112, 2010.
48. C. D'Ambrosio, A. Frangioni, **L. Liberti**, A. Lodi, *On interval subgradient and no-good cuts*, Operations Research Letters, **38**:341-345, 2010.
49. S. Cafieri, J. Lee, **L. Liberti**, *On convex relaxations of quadrilinear terms*, Journal of Global Optimization, **47**:661-685, 2010.
50. S. Cafieri, P. Hansen, **L. Liberti**, *Loops and multiple edges in modularity maximization of networks*, Physical Review E, **81**(4):046102, 2010.
51. G. Nannicini, Ph. Baptiste, G. Barbier, D. Krob, **L. Liberti**, *Fast paths in large-scale dynamic road networks*, Computational Optimization and Applications, **45**:143-158, 2010.
52. S. Cafieri, P. Hansen, **L. Liberti**, *Edge ratio and community structure in networks*, Physical Review E, **81**(2):0261051-14, 2010.
53. P. Belotti, J. Lee, **L. Liberti**, F. Margot, A. Wächter, *Branching and bounds tightening techniques for non-convex MINLP*, Optimization Methods and Software, **24**(4):597-634, 2009.
54. E. Amaldi, **L. Liberti**, F. Maffioli, N. Maculan, *Edge-swapping algorithms for the minimum fundamental cycle basis problem*, Mathematical Methods of Operations Research, **69**:205-233, 2009.
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