

## CURRICULUM VITAE

**Lastname :** Fortz

**Firstname :** Bernard

**Place of Birth :** Namur (Belgium)

**Date of Birth :** May 31, 1971

**Marital Status :** Married

**Nationality :** Belgian

**Addresses:**

HOME :

Rue Delvaux, 11  
B-5380 Cortil-Wodon  
Belgium

Telephone : + (32) 81 83 36 51

WORK :

Université Libre de Bruxelles  
CP 210/01 - Département d'Informatique  
Boulevard du Triomphe  
B-1050 Bruxelles  
Belgium

Telephone : + (32) 2 650 30 95

Fax : + (32) 2 650 56 09

Email : [bernard.fortz@ulb.ac.be](mailto:bernard.fortz@ulb.ac.be)

## Education

**1989-1993 : Facultés Universitaires Notre-Dame de la Paix, Namur**  
Licence en Sciences Mathématiques (B. Sc. Math.)

**1993-1998 : Université Libre de Bruxelles**  
Doctorat en Recherche Opérationnelle (Ph. D. in Operations Research)  
Director : Prof. Martine Labbé.  
Title : “**Design of survivable networks with bounded rings**”

## Professional activities

**October 2006 - now:** Associate professor (chargé de cours).  
Université Libre de Bruxelles, Belgium.

**October 2006 - September 2008:** Invited professor.  
Université Catholique de Louvain, Belgium.

**September 2000 - September 2006:** Associate professor (chargé de cours).  
Université Catholique de Louvain, Belgium.

**January 2000 - August 2000:** Post-doctoral researcher.  
Maastricht University, The Netherlands.

**February 1999 - April 1999:** Consultant researcher.  
AT&T Labs Research, Florham Park, NJ, USA.

**October 1993 - August 2000:** Researcher and teaching assistant.  
Université Libre de Bruxelles, Belgium.

## Publications

- [1] A. Bley, B. Fortz, E. Gourdin, K. Holmberg, O. Klopfenstein, M. Pióro, A. Tomaszewski, and H. Ümit. **Optimization of OSPF Routing in IP Networks**. In A. M. C. A. Koster and X. Muñoz, editors, *Graphs and Algorithms in Communication Networks: Studies in Broadband, Optical, Wireless and Ad Hoc Networks*, chapter 8, pages 199–240. Springer, 2010.
- [2] B. Fortz. **Applications of meta-heuristics to traffic engineering in IP networks**. To appear in *International transactions in Operational Research*, 2010.
- [3] B. Fortz, M. Labbé, and M. Poss. **A branch-and-cut-and-price framework for convex MINLP applied to a stochastic network design problem**. In *European Workshop on Mixed Integer Nonlinear Programming*, 2010. Marseille, France.
- [4] B. Fortz, F. Louveaux, M. Labbé, and M. Poss. **The knapsack problem with gaussian weights**. Technical Report 592, ULB Computer Science Department, 2010. Submitted.

- [5] B. Fortz and M. Poss. **Easy distributions for combinatorial optimization problems with probabilistic constraints.** Technical report, ULB Computer Science Department, 2010. Submitted.
- [6] B. Fortz and H. Ümit. **Efficient Techniques and Tools for Intra-Domain Traffic Engineering.** To appear in *International transactions in Operational Research*, 2010.
- [7] G. Strack, B. Fortz, and F. Riane. **Comparison of Heuristics Procedures for An Integrated Model for Production and Distribution Planning in an Environment of Shared Resources.** In *Proc. 8ème Congrès International de Génie Industriel*, June 2009.
- [8] G. Strack, B. Fortz, and F. Riane. **Heuristic Approaches for Integrated Production and Distribution Planning.** In *Proc. Industrial Engineering and Systems Management (IESM) 2009*, May 2009.
- [9] A. Altin, B. Fortz, and H. Ümit. **Oblivious OSPF routing with weight optimization under polyhedral demand uncertainty.** In *Proc. INOC 2009*, April 2009.
- [10] A. Altin, B. Fortz, M. Thorup, and H. Ümit. **Intra-domain traffic engineering with shortest path routing protocols.** *4OR*, 7(4):301–335, 2009.
- [11] B. Fortz and M. Poss. **An improved Benders decomposition applied to a multi-layer network design problem.** *Oper. Res. Lett.*, 37(5):359–364, 2009.
- [12] A. Altin, B. Fortz, and H. Ümit. **Oblivious OSPF routing with weight optimization under polyhedral demand uncertainty.** Technical Report 588, ULB Computer Science Department, 2008. Submitted.
- [13] Q. Botton and B. Fortz. **Extended Node-Arc Formulation for the K-Edge-Disjoint Hop-Constrained Network Design Problem.** In *Proc. INOC 2007*, April 2007.
- [14] H. Ümit and B. Fortz. **Fast Heuristic Techniques for Intra-Domain Routing Metric optimization.** In *Proc. INOC 2007*, April 2007.
- [15] B. Fortz and M. Thorup. **A primal-dual approach for the IGP weight setting problem.** In *Proc. 8th INFORMS Telecommunication Conference*, March 2006.
- [16] S. Cerav-Erbas, O. Delcourt, B. Fortz, and B. Quoitin. **The interaction of IGP weight optimization with BGP.** In *The international Conference on Internet Surveillance and Protection (ICISP)*, Cap Estérel, France, 29-31 Aug. 2006. IEEE Computer Society.
- [17] B. Fortz and M. Labbé. **Design of survivable networks.** In M.G.C. Resende and P.M. Pardalos, editors, *Handbook Of Optimization In Telecommunications*, chapter 15, pages 367–389. Springer, 2006.

- [18] B. Fortz, A.R. Mahjoub, S.T. Mc Cormick, and P. Pesneau. **Two-edge connected subgraphs with bounded rings: Polyhedral results and Branch-and-Cut.** *Mathematical Programming*, 105:85–111, 2006.
- [19] L. De Giovanni, B. Fortz, and M. Labbé. **A Lower Bound for the Internet Protocol Network Design Problem.** In L. Gouveia, editor, *Proc. INOC 2005*, pages 401–407, March 2005.
- [20] B. Fortz and M. Labbé. **Two-connected networks with rings of bounded cardinality.** *Computational Optimization and Applications*, 27(2):123–148, 2004.
- [21] B. Fortz and M. Thorup. **Increasing Internet Capacity Using Local Search.** *Computational Optimization and Applications*, 29(1):13–48, 2004.
- [22] B. Fortz and M. Thorup. **Robust optimization of OSPF/IS-IS weights.** In W. Ben-Ameur and A. Petrowski, editors, *Proc. INOC 2003*, pages 225–230, October 2003.
- [23] B. Fortz, P. Soriano, and C. Wynants. **A Tabu Search Algorithm for Self-Healing Ring Network Design.** *European Journal of Operational Research*, 151(2):280–295, 2003.
- [24] B. Fortz. **On the evaluation of the reliability of OSPF routing in IP networks.** In *Proc. SSGRR 2002w International Conference - Advances in Infrastructure for e-Business, e-Education, e-Science, and e-Medicine on the Internet*, January 2002.
- [25] C. Allal, B. Colson, and B. Fortz. **A Park & Ride integrated system.** In M. Patriksson and M. Labbé, editors, *Transportation Planning, State of the Art*, chapter 13, pages 213–228. Kluwer Academic Publishers, 2002.
- [26] B. Fortz and M. Labbé. **Polyhedral results for two-connected networks with bounded rings.** *Mathematical Programming*, 93(1):27–54, 2002.
- [27] B. Fortz, J. Rexford, and M. Thorup. **Traffic Engineering with Traditional IP Routing Protocols.** *IEEE Communications Magazine*, 40(10):118–124, 2002.
- [28] B. Fortz and M. Thorup. **Optimizing OSPF/IS-IS Weights in a Changing World.** *IEEE Journal on Selected Areas in Communications*, 20(4):756–767, 2002.
- [29] B. Fortz. *Design of Survivable Networks with Bounded Rings*, volume 2 of *Network Theory and Applications*. Kluwer Academic Publishers, 2000.
- [30] B. Fortz, M. Labbé, and F. Maffioli. **Solving the two-connected network with bounded meshes problem.** *Operations Research*, 48(6):866–877, 2000.
- [31] B. Fortz and M. Thorup. **Internet Traffic Engineering by Optimizing OSPF Weights.** In *Proc. 19th IEEE Conf. on Computer Communications (INFOCOM)*, pages 519–528, 2000.

- [32] P. Soriano, C. Wynants, R. Séguin, M. Labbé, M. Gendreau, and B. Fortz. **Design and dimensioning of survivable SDH networks**. In P. Soriano and B. Sansò, editors, *Telecommunications network planning*, chapter 9, pages 147–168. Kluwer Academic Publishers, 1999.
- [33] B. Fortz, M. Labbé, and F. Maffioli. **Methods for designing reliable networks with bounded meshes**. In V. Ramaswami and P.E. Wirth, editors, *Teletraffic Contributions for the Information Age*, volume 2a of *Teletraffic Science and Engineering*, pages 341–350. Elsevier, 1997.

## Participation to conferences as plenary speaker

2010: EWGLA 2010, Naples, Italy.

2009: EUMEeting 2009, Porto, Portugal.

2004: ALGOTEL'04, Batz-sur-Mer, France.

## Invitation as speaker for seminars

- CORE, Université Catholique de Louvain  
Louvain-la-Neuve, Belgium, December 2009.
- Institut d'Informatique et du Groupe Informatique et Gestions de l'Université de Mons  
Mons, Belgium, June 2009.
- LAAS-CNRS  
Toulouse, France, July 2008.
- Operations Research Department, University of Maastricht  
Maastricht, Netherlands, November 2003.
- CORE, Université Catholique de Louvain  
Louvain-la-Neuve, Belgium, October 2001.
- Université Blaise Pascal - Clermont-Ferrand  
Clermont-Ferrand, France, April 2001.
- I.A.G., Université Catholique de Louvain  
Louvain-la-Neuve, Belgium, March 2001.
- CERTI, Université Catholique de Louvain  
Louvain-la-Neuve, Belgium, February 2001.
- Université Blaise Pascal - Clermont-Ferrand  
Clermont-Ferrand, France, June 2000.
- Philips Research  
Eindhoven, Netherlands, November 1999.

- C.R.T.  
Montréal, Canada, March 1999.
- Operations Research Department, University of Maastricht  
Maastricht, Netherlands, September 1997.
- Politecnico di Milano  
Milan, Italy, February 1995.
- C.R.T.  
Montréal, Canada, December 1994.

## Supervision of PhD theses

Completed:

- Hakan Ümit, “Techniques and Tools for Intra-domain Traffic Engineering” - December 2009 (UCL)

In progress:

- Quentin Botton, “Decomposition Methods for the Optimization of Survivable Telecommunications Networks” (UCL)
- Vincent Ho, “Design of tree networks” (ULB)
- Michael Poss: “Stochastic optimization and network design” (ULB)
- Géraldine Strack, “Impact of centralized decision making in supply chains” (UCL)

## Supervision of Postdoctoral researchers

- Aysegül Altin (ULB, 2008)
- Fauto Pascali (ULB, 2009-2010)
- Selin Cerav (UCL, 2004-2005)
- Pierre Pesneau (UCL, 2003-2004)

## Jurys of PhD theses

- “Advances in robust combinatorial optimization and linear programming”, Martha Salazar Neumann, ULB, 2010. Promotor: Martine Labbé.
- “Sélection Séquentielle en Environnement Aléatoire Appliquée à l’Apprentissage Supervisé”, Olivier Caelen, ULB, 2009. Promotor: Gianluca Bontempi.
- “A Multi-Agent Framework for Developing Adaptable and Open Service Oriented Systems”, Youssef Achbany, UCL, 2009. Promotors: Manuel Kolp et Marco Saerens.

- “Contributions to Traffic Engineering and Resilience in Computer Networks”, Simon Balon, Université de Liège, 2008. Promotor: Guy Leduc.
- “Models and Methods in Molecular Phylogenetics”, Daniele Catanzaro, ULB, 2008. Promotor: Martine Labbé.
- “Network pricing problems: complexity, polyhedral study and solution approaches”, Géraldine Heilporn, ULB, 2008. Promotor: Martine Labbé.
- “Estimation du trafic, planification et optimisation des ressources pour l’ingénierie des réseaux IP/MPLS” (rapporteur), Cédric Fortuny, Université Toulouse III - Paul Sabatier, 2008. Promotor: Jean-Marie Garcia.
- “Interdomain traffic engineering with MPLS”, Cristel Pelsser, UCL, 2006. Promotor: Olivier Bonaventure.
- “BGP-based interdomain traffic engineering”, Bruno Quoitin, UCL, 2006. Promotor: Olivier Bonaventure.
- “Reverse Engineering of Declarative User Interfaces”, Laurent Bouillon, UCL, 2006. Promotor: Jean Vanderdonckt.
- “Design of survivable networks with bounded-length paths”, David Huygens, ULB, 2005. Promotor: Martine Labbé.
- “Optimization of multimedia flows over data networks : the core location problem and the peakedness characterization”, Jean-François Macq, UCL, 2005. Promotors: Benoît Macq et Laurence Wolsey.
- “Pricing in Networks”, Anton F. van der Kraaij, Universiteit Maastricht, 2004. Promotor: Stan Van Hoesel.
- “Implications of traffic characteristics on interdomain traffic engineering”, Steve Uhlig, UCL, 2004. Promotor: Olivier Bonaventure.
- “Exploring structure and reformulations in different integer programming algorithms”, Quentin Louveaux, UCL, 2004. Promotor: Laurence Wolsey.
- “Conception de réseaux 2-connexes avec contraintes de bornes” (rapporteur), Pierre Pesneau, Université Blaise Pascal - Clermont-Ferrand II, 2003. Promotor: Ali Ridha Mahjoub.
- “A Solution Approach of Production Planning Problems based on Compact Formulations for Single-Item Lot-Sizing Models”, Mathieu Van Vyve, UCL, 2003. Promotor: Yves Pochet et Laurence Wolsey.
- “Optimisation du routage dans les réseaux internet avec qualité de service” (rapporteur), Nawal Bourquia, Université Paris IX Dauphine, 2003. Promotors: Pierre Tolla et Eric Gourdin.

- “Optimisation des réseaux, routage et dimensionnement” (rapporteur), Matthieu Rombaut, Université de Versailles, 2003. Promotors: Gérard Hébuterne, Michel Priem.
- “Stronger Mixed 0-1 Models for Lot Sizing Problems”, Marko Loparic, UCL, 2001. Promotor: Laurence Wolsey.
- “Formulations and algorithms for fixed charge networks and lot-sizing problems”, Francisco Ortega, UCL, 2001. Promotor: Laurence Wolsey.

## Distinctions and awards

- Winner of the AT&T Research Prize 1997.
- “Concours Bourses de Voyage” - Communauté Française de Belgique, 1993.

## Patents

- US Patent 6829220 (December 7, 2004): Methods And Systems For Fast Optimization Of Network Traffic  
Inventors: Thorup; Mikkel (Florence, MA); Fortz; Bernard (Cortil-Wodon, BE)  
Assignee: AT&T Corp. (New York, NY)

## Editorial activities

- Guest editor of two special issues of *Networks* (INOC 2007, GOM 2008)
- Associate editor of *INFORMS Journal on Computing* since 2007.

## Conferences organization

- Member of the program committee of the International Network Optimization Conference (INOC 2009), Pisa, April 2009.
- Organizer of the Graphs and Optimization Meeting 2008 (GOM 2008), Saint-Maximim La Sainte Baume, August 2008.
- Member of the program committee of the Triennial conference of the International Federation of Operations Research Societies (IFORS 2008), Sandton, July 2008.
- Member of the program committee of the 6th International Workshop on Design and Reliable Communication Networks (DRCN 2007), La Rochelle, October 2007.
- Organizer and program chair of the International Network Optimization Conference (INOC 2007), Spa, April 2007.

- Member of the program committee of the Triennial conference of the International Federation of Operations Research Societies (IFORS 2005), Hawaii, July 2005.
- Member of the program committee of the International Network Optimization Conference (INOC 2005), Lisbon, March 2005.
- Member of the scientific committee of Orbel from 1999 to 2010.
- Organizer of ORBEL 19, Louvain-la-Neuve, January 2005.
- Member of the organizing committee of Combinatorial Optimization 98, Brussels, April 1998.

## **Miscellaneous activities**

**1995-** : Member of the board of administration of SOGESCI (Belgian OR Society).

**2003-** : SOGESCI representative for EURO and IFORS.

**2005-** : Coordinator of EURO Working Group: “European Network Optimization Group (ENOG)”.

**2006-** : Treasurer of SOGESCI.

**2008-2012:** INFORMS Telecom Section: Member of Council.

**2008:** Expert (hired by Belpex) in the evaluation panel of algorithms for the electricity markets, in view of the merge of the French, German, Dutch and Belgian markets.

**2009:** Vice-president of the Computer Science Department, Faculty of Science, ULB.

**2010-** : President of the Computer Science Department, Faculty of Science, ULB.

## **Research interests**

- Combinatorial optimization
- Meta-heuristics
- Design of telecommunications networks
- Traffic engineering in IP networks