

CRAINIC, Teodor Gabriel

CURRICULUM VITAE – SUMMARY

Teodor Gabriel Crainic, Ph.D., FRSC

Professor of Operations Research, Logistics and Transportation

Chair on Logistics Management

School of Management, Université du Québec à Montréal

and

Director, Intelligent Transportation Systems Laboratory,

Interuniversity Research Center on Network Enterprises, Logistics, and Transportation (CIRRELT)

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Honorary positions as Adjunct Professor

- Dept. Computer Science and Operations Research, Université de Montréal (2991-)
- Dept. Economics & Business Administration, Molde University, Norway (2001-2013)
- Dept. Computer Science, University of Manitoba, Winnipeg, Canada (2003-2006)

Education

- B.Sc. (1976) Computer Science and Operations Research, Université de Montréal
- M.Sc. (1978) Operations Research, Université de Montréal
- Ph.D. (1982) Operations Research, Université de Montréal
- Post-doc (1982-1983) Pisa University, Italy, and Massachusetts Institute of Technology

Positions

- Full Professor, School of Management, Université du Québec à Montréal (1993-)
- Scientist member, Interuniversity Research Center on Network Enterprises, Logistics, and Transportation (CIRRELT; previously Centre for Research on Transportation) (1986 -)
- NSERC Industrial Research Chair on Logistics Management, School of Management, Université du Québec à Montréal (2006-2011)
- Assistant and Associate Professor, Université du Québec à Montréal (1986-1993)
- Director, Centre for Research on Transportation, Université de Montréal (1991-1999)
- Researcher, Centre for Research on Transportation, Université de Montréal (1983-1986)

Prizes

- Fellow of the Royal Society of Canada (2006-)
- Merit Award of the Canadian Operational Research Society (2006)

Invited Professor

- Vienna University of Economics and Business, Austria (2014)
- Université de Valenciennes et du Hainaut-Cambrésis, France (2013-2015)
- Politecnico di Torino (2008, 2010)
- Università di Cagliari (2009, 2012)

CRAINIC, Teodor Gabriel

- Sapienza Università di Roma (2001, 2005, 2011)
- Université Mohammed V - Souissi, Rabat, Morocco (2010)
- Poznan University of Technology, Poznan, Poland (2008)

International activities other than research projects (a selection)

- Co-founder, *TRISTAN (TRiennial Symposium on Transportation Analysis)*, 1991, the next one in June 2016, The Netherlands
- Co-founder, *ODYSSEUS* a triennial *International Workshop on Freight Transportation and Logistics*, 2000, the next one in June 2015, France
- Many (3 to 5 yearly) organization and scientific committees for international conferences
- Associate Editor, *Transportation Science* (2007-)
- Area Editor, *Journal of Heuristics* (2001-)
- Associate Editor, *Transportation Research Part C: Emerging Technologies* (2005-2012)
- Associate Editor, *Operations Research* (1988-1995)
- Invited editor for several special issues for *Transportation Science* (2015, 2009, 2002, ...), *Journal of Heuristics* (2010) *International Journal of Production Research* (2015), *EJOR* (2014), etc.
- President *Transportation and Logistics Society* of INFORMS (2010) and *Transportation Science Section* of INFORMS (1997)

Research interests

Network, integer, and combinatorial optimization, meta-heuristics, and parallel computing applied to the planning and management of complex systems, particularly in transportation and logistics. Major contributions targeted methods for national/regional planning, the design and scheduling of services for consolidation-based carriers (railroads, motor carriers, land and sea intermodal carriers, etc.), operations management for modal and intermodal carriers and terminal operators, routing and scheduling, Intelligent Transportation Systems, City Logistics, and electronic business. He authored more than 210 scientific articles and book chapters, and gave some 50 plenary presentations and tutorials at international conferences, 650 presentations at scientific conferences, and 145 invited seminars at universities and organizations around the world. He coauthored STAN, a method and software system for strategic planning of multimodal multicommodity transportation systems used by planning institutions in several countries, and a combinatorial e-auction mechanism for transportation markets. He supervised some 25 postdoctoral fellows, 40 doctoral students, and 50 master students.

Recent Refereed Journal Publications

1. Crainic T.G., Dell'Olmo P., Ricciardi N., Sgalambro A. (2015), Modeling Dry-Port-based Freight Distribution Planning, *Transportation Research - Part C: Emerging Technologies*, doi:10.1016/j.trc.2015.03.026
2. Chouman M., Crainic T.G. (2013), Cutting-Plane Matheuristic for Service Network Design with Design-Balanced Requirements, *Transportation Science* 49(1), 99-113.
3. Crainic T.G., Errico F., Rei W., Ricciardi N. (2015), Modeling Demand Uncertainty in Two-Tier City Logistics Tactical Planning, *Transportation Science*.

4. Davidovic T., Crainic T.G.(2015), Parallel Local Search to Schedule Communicating Tasks on Identical Processors, *Parallel Computing*.
5. Rahimi Vahed A., Crainic T.G., Gendreau M., Rei W. (2015), Fleet-sizing for multi-depot and periodic vehicle routing problems using a modular heuristic algorithm, *Computers & Operations Research* 53(1), 9-23.
6. Vidal T., Crainic T.G., Gendreau M., Prins C. (2015), Timing Problems and Algorithms, *Networks* 65(2), 102-128
7. Crainic T.G., Hewitt M., Rei W. (2014), Scenario Grouping in a Progressive Hedging-based Meta-heuristic for Stochastic Network Design, *Computers & Operations Research* 43, 90-99.
8. Crainic T.G., Sgalambro A. (2014), Service Network Design Models for Two-tier City Logistics, *Optimization Letters* 8(4), 1375-1387.
9. Dayarian I., Crainic T.G., Gendreau M., Rei W. (2014), A Branch-and-Price Approach for a Multi-Period Vehicle Routing Problem, *Computers & Operations Research*.
10. Dayarian I., Crainic T.G., Gendreau M., Rei W. (2014), A Branch-and-Price Approach for a Multi-Period Vehicle Routing Problem, *Computers & Operations Research*.
11. Jin J., Crainic T.G., Lokketangen A. (2014), A Cooperative Parallel Metaheuristic for the Capacitated Vehicle Routing Problem, *Computers & Operations Research* 44, 33-41.
12. Nguyen K.P., Crainic T.G., Toulouse M. (2014), A Hybrid Generational Genetic Algorithm for the Periodic Vehicle Routing Problem with Time Windows, *Journal of Heuristics*, 20(4), 383-416.
13. Vidal T., Crainic T.G., Gendreau M., Prins C. (2014), Time-Window Relaxations in Vehicle Routing Heuristics, *Journal of Heuristics*.
14. Vidal T., Crainic T.G., Gendreau M., Prins C. (2014), Implicit Depot Assignments and Rotations in Vehicle Routing Heuristics, *European Journal of Operational Research* 237(1) 15-28.
15. Vidal T., Crainic T.G., Gendreau M., Prins C. (2014), A Unified Solution Framework for Multi-Attribute Vehicle Routing Problems, *European Journal of Operational Research* 234(3), 658-673.
16. Thiki C., Oprea S., Beraldi P., Crainic T.G. (2014), The Stochastic Bid Generation Problem in Combinatorial Transportation Auctions, *European Journal of Operational Research* 236(3), 991-999.
17. Zhu E., Crainic T.G., Gendreau M. (2014), Scheduled Service Network Design for Freight Rail Transportation, *Operations Research* 62(2) 383-400.
18. Abrache J., Crainic T.G., Gendreau M., Aouam T. (2013), A Study of Auction Mechanisms for Multilateral Procurement Based on Subgradient and Bundle Methods, *INFOR* 51(1), 2-14.
19. Crainic T.G., Hewitt M., Toulouse M., Vu D.M. (2013), Service Network Design with Resource Constraints, *Transportation Science* x.doi.org/10.1287/trsc.2014.0525
20. Errico F., Crainic T.G., Malucelli F., Nonato M. (2013), A Survey on Planning Semi-Flexible Transit Systems: Methodological Issues and a Unifying Framework, *Transportation Research Part C: Emerging Technologies* 36, 324-338.
21. Labrichi N., Crainic T.G., Gendreau M., Rei W., Rousseau L.-M. (2013), Strategic Analysis of the Dairy Transportation Problem, *Journal of the Operational Research Society* doi:10.1057/jors.2013.147
22. Lai M., Crainic T.G., Di Francesco M., Zuddas P. (2013), Heuristic search for the routing of heterogeneous trucks with single and double container loads, *Transportation Research Part E: Logistics and Transportation* 56, 108-118.

23. Nguyen K.P., Crainic T.G., Toulouse M. (2013), A tabu search for Time-dependent Multi-zone Multi-trip Vehicle Routing Problem with Time Windows, *European Journal of Operational Research* 231(1), 43-56.
24. Rahimi Vahed A., Crainic T.G., Gendreau M., Rei W. (2012), A Path Relinking Algorithm for a Multi-Depot Periodic Vehicle Routing Problem, *Journal of Heuristics* 19(3), 497-524.
25. Vidal T., Crainic T.G., Gendreau M., Prins C. (2013), Heuristics for Multi-Attribute Vehicle Routing Problems: A Survey and Synthesis, *European Journal of Operations Research* 231(1) 1-21.
26. Vidal T., Crainic T.G., Gendreau M., Prins C. (2013), A Hybrid Genetic Algorithm with Adaptive Diversity Management for a Large Class of Vehicle Routing Problems with Time Windows, *Computers & Operations Research* 40(1), 475-489.
27. Vu D.M., Crainic T.G., Toulouse M. (2013), A Three-Phase Matheuristic for the Capacitated Multi-commodity Fixed-Cost Network Design with Design-Balance Constraints, *Journal of Heuristics* 19, 757-795.
28. Baldi M.M., Crainic T.G., Perboli G., Tadei R. (2012), The Generalized Bin Packing Problem, *Transportation Research Part E: Logistics and Transportation Review* 48(2), 1205-1220.
29. Baldi M.M., Crainic T.G., Perboli G., Tadei R. (2012), Branch-and-Price and Beam Search Algorithms for the Variable Cost and Size Bin Packing Problem with Optional Items, *Annals of Operations Research*, DOI 10.1007/s10479-012-1283-2
30. Contardo C., Hemmelmayr V., Crainic T.G. (2012), Lower and Upper Bounds for the Two-Echelon Capacitated Location-Routing Problem, *Computers & O.R.* 39(12), 3185-3199.
31. Crainic, T.G., Errico, F., Malucelli, F., Nonato, M. (2010), Designing the master schedule for demand-adaptive transit systems, *Annals of Operations Research* 194(1), 151-166.
32. Hemmelmayr V., Cordeau J.-F., Crainic T.G. (2012), An Adaptive Large Neighborhood for Two-Echelon Vehicle Routing Problems Arising in City Logistics, *Computers & O.R.* 39(12), 3215-3228.
33. Jin J., Crainic T.G., Lokketangen A. (2012), A parallel multi-neighborhood cooperative tabu search for Capacitated Vehicle Routing Problems, *European Journal of Operational Research* 222(3), 441-451.
34. Thapalia B.Kr., Kaut M., Wallace S.W., Crainic T.G. (2012), Single Source Single-Commodity Stochastic Network Design, *Computational Management Science* 9(1), 139-160.
35. Thapalia B.Kr., Crainic T.G., Kaut M., Wallace S.W., (2012), Single-Commodity Stochastic Network Design with Random Edge capacities, *European Journal of Operational Research* 220(2), 394-403.
36. Vidal T., Crainic, T.G., Gendreau M., Lahrichi, N., Rei, W. (2012), A Hybrid Genetic Algorithm for Multidepot and Periodic Vehicle Routing Problems, *Operations Research* 60(3), 611-624.
37. Andersen, J., Crainic, T.G., Christiansen, M., Gronhaug, R. (2011), Branch-and-Price for Service Design with Asset Management Considerations, *Transportation Science* 45(1), 33-49.
38. Crainic T.G., Fu X., Gendreau M., Rei W., Wallace S.W. (2011), Progressive Hedging-based Meta-heuristics for Stochastic Network Design, *Networks* 58(2), 114-124.
39. Crainic, T.G., Perboli, G., Rei, W., Tadei, R. (2011), Efficient lower bounds and heuristics for the Variable Cost and Size Bin Packing Problem, *Computers & O.R.* 38(11), 1474-1482.
40. Thapalia B.K., Crainic T.G., Kaut M., Wallace S.W., (2011), Single-Commodity Stochastic Network Design with Multiple Sources and Sinks, *INFOR* 49(3), 195-214.

41. Bauer, J., Bektas, T., Crainic T.G. (2010), Minimizing Greenhouse Gas Emissions in Intermodal Freight Transport: An Application to Rail Service Design, *Journal of the Operational Research Society* 61, 530-542.
42. Bektas T., Chouman M., Crainic T.G. (2010), Lagrangean-based decomposition algorithms for multicommodity network design with penalized constraints, *Networks* 55(3), 171-180.
43. Hoff, A., Lium, A.G., Løkketangen, A., Crainic, T.G. (2010), A metaheuristic for stochastic service network design, *Journal of Heuristics* 16(1), 653-679.
44. Andersen, J., Crainic, T.G., Christiansen, M. (2009), Service network design with asset management: Formulations and comparative analyzes, *Transportation Research Part C: New Technologies* 17(2), 197-207.
45. Andersen, J., Crainic, T.G., Christiansen, M. (2009), Service network design with management and coordination of multiple fleets, *European Journal of Operational Research* 193(2), 377-389.
46. Bektas, T., Crainic, T.G., Morency, V. (2009), Improving performance of rail yards through dynamic reassignments of empty cars, *Transportation Research Part C: New Technologies* 17(3), 259-273.
47. Benjelloun, A., Crainic, T.G., Bigras, Y. (2009), Trends, Challenges and Perspectives in City Logistics, *Buletinul AGIR* 4, 45-51.
48. Crainic T.G., Gendreau M., Potvin, J.-Y. (2009), Intelligent freight transportation systems: An historic assessment and the contribution of operations research, *Transportation Research C: Emerging Technologies* 17, 541-557.
49. Crainic, T.G., Perboli, G., Tadei, R. (2009), TS2PACK: A two-stage tabu search heuristic for the three-dimensional bin packing problem, *European Journal of Operational Research* 195(3), 744-760.
50. Crainic, T.G., Ricciardi, N., Storchi, G. (2009), Models for evaluating and planning City Logistics transportation systems, *Transportation Science* 43(4), 432-454.
51. Di Francesco M., Crainic T.G., Zuddas P. (2009), The effect of multi-scenario policies on empty container repositioning, *Transportation Research E: Logistics and Transportation* 45(5), 758-770.
52. Lium, A.-G., Crainic, T.G., Wallace, S.W. (2009), A study of demand stochasticity in service network design, *Transportation Science* 43(2), 144-157
53. Pedersen, M.B., Crainic, T.G., Madsen, O.B. (2009), Models and tabu search meta-heuristics for service network design with asset-balance requirements, *Transportation Science* 43(2), 158-177.

REFEREED CONFERENCE PROCEEDINGS & Book Chapters 2009-2015

1. Wang Y., Bilegan I.C., Crainic T.G., Artiba A. (2014), Performance indicators for planning intermodal barge transportation systems, *Proceedings EWGT2014 - 17th Meeting of the EURO Working Group on Transportation, Transportation Research Procedia* 3, 621-630, Elsevier.
2. Abrache J., Crainic T.G., Gendreau M., Aouam T. (2014), An Auction Mechanisms for Multilateral Procurement Based on Dantzig-Wolfe Decomposition, *Proceedings of the 2nd International IEEE Conference on Logistics Operations Management*, Y. Benadada, J. Boukachour, A.A. Elhilali (Eds.), 16-22, ENSIAS, Rabat, Maroc.
3. Crainic T.G., Davidović T., Ramljak D. (2014), Designing Parallel Meta-Heuristic Methods, High Performance and Cloud Computing in Scientific Research and Education, Despotovic-Zrakic M., Milutinovic V., Belic A. (Eds.), 260-280, IGI Global.
4. Baldi M.M., Crainic T.G., Perboli G., Tadei R. (2014), Asymptotic results for the Generalized Bin Packing Problem, *Procedia - Social and Behavioral Sciences*, Vol 111, 663-671, Elsevier.

5. Mancini S., Gonzalez-Feliu J., Crainic T.G. (2014), Planning and Optimization Methods for Advanced Urban Logistics Systems at Tactical Level, Sustainable Urban Logistics: Concepts, Methods and Information Systems, J. Gonzalez-Feliu, F. Semet, J.-L. Routhier (Eds), 145-164, Springer.
6. Crainic T.G., Marcotte S., Rei W., Takouda P.L. (2013), Proactive Order Consolidation in Global Sourcing, Handbook of Global Logistics - Transportation in International Supply Chains, J. H. Bookbinder (Ed.), 501- 530, Springer.
7. Crainic T.G., Gobbato L., Perboli G., Rei W., Watson J.-P., Woodruff D.L. (2014), Bin Packing Problem with uncertainty on item characteristics: an application to capacity planning in logistics}, Procedia - Social and Behavioral Sciences, Vol 111, 654-662, Elsevier.
8. Crainic T.G., Mancini S., Perboli G., Tadei R. (2013), A GRASP with Path Relinking for the Two-Echelon Vehicle Routing Problem}, Advances in Metaheuristics, L. Di Gaspero, A. Schaerf, T. Stützle (Eds), Operations Research/Computer Science Interfaces Series 53, 113-125, Springer.
9. Davidović T., Crainic T.G.(2012) MPI Parallelization of Variable Neighborhood Search, EURO Mini Conference XXVIII dedicated to Variable Neighborhood Search (EUROmC-XXVIII-VNS), Herceg-Novti, Montenegro, October 4-7, 2012, Electronic Notes in Discrete Mathematics, 39, 241-248, Elsevier.
10. Crainic T.G.,Perboli G., Tadei R. (2012), Recent Advances in Multi-dimensional Packing and Loading Problems, New Technologies - Trends, Innovations and Research, C. Volosencu (Ed.), 91-110, InTech - Open Access Publisher, ISBN 978-953-51-0480-3.
11. Crainic, T.G., Mancini, S., Perboli, G., Tadei, R. (2012), A GRASP with Path relinking for the Two-Echelon Vehicle Routing Problem, MIC 2011 Proceedings, L. Di Gaspero, A. Schaerf, T. Stützle (Eds).
12. Crainic, T.G., Errico, F., Rei, W. Ricciardi, N. (2012), Integrating c2e and c2c Traffic into City Logistics Planning, E. Taniguchi and R.G. Thompson (Eds.), Procedia - Social and Behavioral Sciences, Volume 39, 47-60, Elsevier.
13. Crainic, T.G., Mancini, S., Perboli, G., Tadei, R. (2011), Impact of generalized Travel Costs on satellite Location in Two-Echelon VRP, E. Taniguchi and R.G. Thompson (Eds.), Procedia - Social and Behavioral Sciences, Volume 39, 195-204, Elsevier.
14. Jin J., Crainic T.G., Lokketangen A. (2011), A Guided Cooperative Parallel Tabu Search for the Capacitated Vehicle Routing Problem, Proceedings Norsk Informatikk Konferanse, NIK 2011, 49--60, Tapir Akademisk Forlag.
15. Crainic, T.G., Perboli, G., Tadei, R. (2011), An Efficient Meta-heuristic for Multi-Dimensional Multi-Container Packing, CASE 2011 - The 2011 IEEE International Conference on Automation Science and Engineering, 563-568, IEEE.
16. Crainic, T.G., Mancini, S., Perboli, G., Tadei, R. (2011), Multi-start Heuristics for the Two-Echelon Vehicle Routing Problem, Lecture Notes in Computer Science Volume 6622, P. Merz, J.-K. Hao (Eds), 179--190, Springer-Verlag, Berlin Heidelberg.
17. Crainic T.G., Toulouse, M. (2010), Parallel Meta-heuristics, Handbook of Metaheuristics, M. Gendreau, J.-Y. Potvin (Eds.), 497-541, Springer.
18. Boccia, M., Crainic, T.G., Sforza, A., Sterle, C. (2010), A Metaheuristic for a Two-Echelon Location-Routing Problem, Lecture Notes in Computer Science, Vol. 6049, Festa P. (ed.), 288-301, Springer-Verlag, Berlin.
19. Crainic, T.G., Florian, M. (2010). Optimization Models for Transportation Systems Planning. Application of Combinatorial Optimization. V.Th. Paschos (ed.), ISTE Wiley, Londres, 177-207.

20. Crainic, T.G., Semet, F. (2010). Operations Research and Goods Transportation. Optimisation combinatoire : applications. V. Th. Paschos (ed.), ISTE Wiley, Londres, 111-175.
21. Benjelloun, A., Crainic, T.G., Bigras, Y. (2010), Toward a Taxonomy of City Logistics Projects, *Procedia - Social and Behavioral Sciences* 2(3), 6217--6228, Elsevier.
22. Crainic, T.G., Perboli, G., Mancini, S., Tadei, R. (2010), Two-Echelon Vehicle Routing Problem: A Satellite Location Analysis, *Procedia - Social and Behavioral Sciences* 2(3), 5944--5955, Elsevier.
23. Schrenk S., Crainic T.G., Cung V.D., Finke G. (2010), Comparaison de différentes formulations de conception de réseaux pour un problème de transport de fret avec gestion de véhicules, *Combinatorial Optimization in Practice, Special issue dedicated to Catherine Roucairol, A. Bui, I. Tseveendorj (eds.)*, 35-59, Hermann Informatique, Paris.
24. Crainic, T.G. (2009), Service design models for rail intermodal transportation, *Innovations in distribution logistics, Lecture Notes in Economics and Mathematical Systems*, L. Bertazzi, M.G. Speranza, J.A.E.E. van Nunen, (Eds.), Springer-Verlag, volume 619, 53-67, Berlin.
25. Crainic, T.G., Crisan, G.C., Gendreau M., Lahrichi, N., Rei, W. (2009), Integrative Cooperative Meta-heuristics for Rich Combinatorial Problems, *Proceedings of MIC 2009 VIII Metaheuristic International Conference, Hamburg, Germany, 13-16 July, CD-ROM, Universitat Hamburg*.
26. Crainic, T.G., Crisan, G.C., Gendreau M., Lahrichi, N., Rei, W. (2009), A Concurrent Evolutionary approach for Rich Combinatorial Problems, *Proceedings GECCO 2009 Genetic and Evolutionary Computation Conference, Montréal, Canada, 8-12 July, CD-ROM, ACM Order Number 910092*.
27. Crainic, T.G., Crisan, G.C., Gendreau M., Lahrichi, N., Rei, W. (2009), Multi-thread Integrative Cooperative Optimization for Rich Combinatorial Problems, *The 12th International Workshop on Nature Inspired Distributed Computing - NIDISC'09, 25-29 May, Rome, Italy, CD-ROM*.
28. Benjelloun, A., Crainic, T.G., Bigras, Y. (2009), Toward a Taxonomy of City Logistics Projects, *City Logistics VI: Proceedings of the 6th International Conference on City Logistics, Puerto Vallarta, Mexico, 30 June - 2 July, 409-421, Institute for City Logistics, Kyoto, Japon*.
29. Crainic, T.G., Perboli, G., Mancini, S., Tadei, R. (2009), Two-Echelon Vehicle Routing Problem: A Satellite Location Analysis, *City Logistics VI: Proceedings of the 6th International Conference on City Logistics, Puerto Vallarta, Mexico, 30 June - 2 July, 65-75, Institute for City Logistics, Kyoto, Japon*.
30. Crainic T.G., Errico F., Malucelli F., Nonato M. (2009), On the Design of a Flexible Transportation System, *Transport Management and Land-use Effects in Presence of Unusual Demand, Proceeding of the XVI international conference SIDT2009, Milano, Italy, 29-30 June, L. Mussone, U. Crisalli (Eds.)*, 105-110.