

Rahma Lahyani

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Positions

08/2015–	Assistant Professor of Operations Management & Management Sciences	CoB, Alfaisal University
12/2014–07/2015	Post doctoral fellow	CIRRELT, Laval University
07/2014–11/2014	Post doctoral fellow	LAGIS, École Centrale de Lille
01/2011–06/2014	Ph.D. student (CNRS)	LAGIS, École Centrale de Lille
09/2013–08/2014	Instructor of Quantitative Methods	École Centrale de Lille, Mathematics-Computer Science department
09/2012–08/2013	Instructor of Quantitative Methods	École Centrale de Lille, Mathematics-Computer Science department

Degrees

2015	Qualification for the Rank of Associate Professor (Maître de Conférence) <i>Section 61</i> : Automatic <i>Section 27</i> : Computer Engineering Ministry of Higher Education and Scientific Research, France
2014	Ph.D. , École Centrale de Lille, Lille, France <i>Major</i> : Supply Chain Management, Quantitative Methods <i>Supervisors</i> : Frédéric Semet, Mahdi Khemakhem and Habib Chabchoub <i>Team</i> : Optimization of Logistics Systems (OSL) <i>Laboratory</i> : Automation, Computer Engineering, Image and Signal Processing (LAGIS) <i>Defended on</i> : June 13 th , 2014

Research Interest

My main research activities are in the field of *logistics*. They encompass multi-attribute and challenging problems arising in the supply chain management from strategic to operational decisions, focusing on yielding efficient and effective transportation and distribution systems. They include mathematical modeling and developing metaheuristics and exact solution algorithms to solve academic and rich practical problems. Recently, we have solved a real-world logistics application arising in the collection of olive oil in Tunisia. A part of my research is dedicated to experimental design and performance analysis. For more details, please see the list of publications.

Awards, Grants and Scholarships

- **Best Research Award**, College of Business, Alfaisal University, 2017-2018.

- **Best MBA Teacher Award**, College of Business, Alfaisal University, 2016-2017.
- **Second Best Award** in the 8th Annual Research Day Student Poster Competition. "Open vehicle routing problem: state of the art classification and review", presented by Ibrahim AlSemari (College of Business B.Sc., student), April 2017.
- **Internal Research Grant** from Alfaisal University "Optimization-based adaptive large neighborhood search for a rich distribution problem." 2016-2018.
- Award of excellence for the **Best Presentation** at the 1st Annual Tunisian Operational Research Society Conference", TORS'15, June 2015.
- **Post Doctoral Fellowship** at CIRRELT, Québec City, from 12/2014.
- **Post Doctoral Fellowship** at École Centrale de Lille "Optimizing vehicle routing problems" from 07/2014 to 11/2014.
- **Scholarship** from the University of Lille Nord de France and the Central Foundation Initiatives "Help to international mobility" to fund a one-month internship at the Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT), Montréal, July 2013.
- Award of the **Best Student Paper** at the 1st IEE International Conference on Logistics , May 2011.
- **Three-years Doctoral Scholarship** granted by the National Center for Scientific Research (CNRS), 01/2011-12/2013.
- Award of excellence for the **Best Promotion Student** for the M.Sc., 2008-2009.
- Award of excellence for the **Second Best Promotion student** for the B.Sc., 2005-2006, 2006-2007 and 2007-2008.

Publications

International Journals

1. **R. Lahyani, L. Coelho, J. Renaud**, 2018. *Alternative Formulations and Improved Bounds for the Multi-Depot Fleet Size and Mix Vehicle Routing Problem*, Operations Research Spectrum, 40(1), pp: 125-157.
2. **T. Chabot, R. Lahyani, L. Coelho, J. Renaud**, 2017. *Order Picking Problems under Weight, Fragility and Category Constraints*, International Journal of Production Research, 55(21), pp: 6361-6379.
3. **R. Lahyani, M. Khemakhem, F. Semet**, 2017. *A unified matheuristic for solving multi-constrained traveling salesman problems with profits*, EURO Journal on Computational Optimization, 5(3), pp:393-422.
4. **R. Lahyani, M. Khemakhem, F. Semet**, 2015. *Rich vehicle routing problems: From a taxonomy to a definition*, **The Lead Article** in European Journal of Operational Research, 241(1), pp:1-14. Ranked **13th** on the **top 25** for EJOR, October to December 2014.
5. **R. Lahyani, L. C. Coelho, M. Khemakhem, G. Laporte, F. Semet**, 2015. *A multi-compartment vehicle routing problem arising in the collection of olive oil in Tunisia*, **The Lead Article** in OMEGA, 51, pp:1-10.
6. **R. Lahyani**, 2014. *Unified matheuristic for solving rich vehicle routing problems*, 4OR-A Quarterly Journal of Operations Research, 13-2:223-224.

Book Chapters

7. **R. Lahyani, F. Semet, B. Trouillet**, 2014. *Vehicle routing problems with scheduling constraints*, in Metaheuristics for production scheduling, P. Siarry, B. Jarboui, J. Teghem, editor, ISTE-John Wiley. ISBN: 978-1-84821-497-2.

8. **R. Lahyani, F. Semet, B. Trouillet**, 2013. *Problèmes d'élaboration de tournées avec contraintes d'ordonnancement*, dans Métaheuristiques pour l'ordonnancement de la production, P. Siarry, B. Jarboui, J. Teghem, éditeurs, Hermès Sciences/ISTE-John Wiley, ISBN : 978-2-7462-3926-5.

International Conferences with Proceedings

9. **T. Chabot, R. Lahyani, L. C. Coelho, J. Renaud**, 2017. Alternative heuristics for solving multi-constrained order picking problem, Proceeding of the 9th IEEE-GCC Conference, Bahrain.
10. **R. Lahyani, M. Khemakhem, F. Semet**, 2013. *For solving rich orienteering problems*, Tristan VIII, Chile.
11. **R. Lahyani, M. Khemakhem, H. Chabchoub, F. Semet**, 2013. *Heuristics for rich profitable tour problems*, Proceedings of the 5th International Conference on Modeling, Simulation and Applied Optimization, Tunisia, IEEE International Conference, ISBN 978-1-4673-5812-5.
12. **R. Lahyani, M. Khemakhem, F. Semet, H. Chabchoub**, 2012. *Taxonomy for multi-attribute vehicle routing problems*, Proceedings of the 1st International Conference on Logistics Operations Management, IEEE International Conference-GOL'12, France.
13. **R. Lahyani, M. Khemakhem, H. Chabchoub, F. Semet**, 2011. *Design factors analysis for instances of rich vehicle routing problems*, **Best Student Paper** in Proceedings of the 4th International Conference on Logistics 2011, Tunisia, IEEE International Conference, pp:209-215, ISBN 978-1-4577-0322-5.
14. **R. Lahyani, M. Khemakhem, H. Chabchoub, F. Semet**, 2011. *Rich vehicle routing problem: model and experimental design analysis*, Proceedings of the International Conference on Industrial Engineering and Systems Management, ENIM&I4e2, France, pp:1300-1310, ISBN 978-2-9600532-3-4.

Conferences

15. **R. Lahyani, L. C. Coelho, J. Renaud**, 2017. The Multi-Depot Fleet Size and Mix Vehicle Routing Problem: Formulations and Branch-and-Cut Algorithms. MOPGP 2017, Metz, France.
16. **T. Chabot, R. Lahyani, L. C. Coelho, J. Renaud**, 2016. Order picking under weight, fragility and category constraints, 17^{ème} conférence de la société Française de Recherche Opérationnelle et Aide à la Décision- ROADEF 16, France.
17. **R. Lahyani, L. C. Coelho, J. Renaud**, 2015. *Formulations and exact algorithms for the Multi-depot Fleet Size and Mix Vehicle Routing Problem*, VeRoLog 2015, Austria.
18. **R. Lahyani, L. C. Coelho, J. Renaud**, 2015. *Formulations and exact algorithms for the Multi-depot Fleet Size and Mix Vehicle Routing Problem*, CORS/INFORMS 2015, Canada.
19. **R. Lahyani, L. C. Coelho, J. Renaud**, 2015. *A Multi-Compartment Vehicle Routing Problem Arising in the Collection of Olive Oil in Tunisia*, TORS 2015, Tunisia.
20. **R. Lahyani, M. Khemakhem, F. Semet**, 2014. *A unified mathheuristic framework for multi-constraint traveling salesman problems with profits*, VeRoLog 2014, Norway.
21. **R. Lahyani, M. Khemakhem, F. Semet**, 2014. On unified solution approach for solving multi-constraint travelling salesman problems with profits, 15^{ème} conférence de la société Française de Recherche Opérationnelle et Aide à la Décision- ROADEF 14, France.
22. **R. Lahyani, M. Khemakhem, F. Semet**, 2013. A unified heuristic for solving rich variants of orienteering problems, 14^{ème} conférence de la société Française de Recherche Opérationnelle et Aide à la Décision- ROADEF 13, France.
23. **R. Lahyani, M. Khemakhem, F. Semet**, 2012. *A general variable neighborhood search for a rich orienteering problem*, International Conference on Metaheuristics and Nature Inspired Computing-META'12, Tunisia.
24. **R. Lahyani, M. Khemakhem, H. Chabchoub**, 2010. *A multi compartment heterogeneous fixed fleet vehicle routing problem with time windows: New variants and formulations*, The 9th International Conference on Multiple Objective Programming and Goal Programming- MOPGP'10, Tunisia.

Technical Report

25. R. Lahyani, M. Khemakhem, F. Semet, H. Chabchoub, 2012. *Rich vehicle routing problem with compartments: generic model, experimental design analysis and new data set generator*, Technical Report, École Centrale de Lille, Lille.

Invited Revisions

- *An adaptive large neighborhood search for the multi depot open vehicle routing problem* (with A.L. Gouguenheim and L.C. Coelho), 1st revision.

Works in Progress

- *Column generation based math-heuristic for solving basic and rich vehicle routing problems* (with M. Khemakhem, F. Semet, B. Gendron).

Invited Talks

Rich vehicle routing problems: from a taxonomy to a unified math heuristic. CIRRELT Conference, Québec, Canada, May 2015.

Supervising Experience

1. Sabrine Ismail (M.Sc. student), "For solving the multi depot fleet size and mix open VRP", with Habib Chabchoub, February 2017-July 2018.
2. Ibrahim AlSemari (B.Sc. student), "Open vehicle routing problem: state of the art classification and review", December 2016-April 2017.
3. Thomas Chabot (Ph.D. student), "Order Picking Problems under Weight, Fragility and Category Constraints", with Leandro C. Coelho, Jacques Renaud, March 2015–December 2016.
4. Anne-Lise Gouguenheim (B.Sc. student), "An adaptive large neighborhood search for the multi depot open VRP", with Leandro C. Coelho, May 2015–August 2015.
5. Alexandra Roy (M.Sc. student), "Multi-compartment vehicle routing problem: a categorized bibliography", with Leandro C. Coelho, April 2015–June 2015.
6. Khalil Chebil (Ph.D. student), "An adaptive large neighborhood search for the multiple knapsack problem with setup", with Leandro C. Coelho and Mahdi Khemakhem, April 2015,.
7. Alireza Avakh (Ph.D. student), "An adaptive large neighborhood search for the multi knapsack problem with conflicts", with Leandro C. Coelho, March 2015–July 2015.
8. Louis Fisltruff (B.Sc. student), "Developing and studying several exact models for the loading aspect arising in logistics problems", with Frédéric Semet, December 2013-April 2014.

Teaching Experience

MBA Courses

- Quantitative analysis
- Operations strategy

Undergraduate Courses

- Quantitative methods for business

- Operations management
- Operations research (Linear and non-linear programming)
- Operations research and numerical analysis for optimization
- Advanced algorithms and complexity
- Introduction to decisional computer science (Excel solver, Access, VBA)
- C programming language

Professional Activities and Memberships

- Organize and chair a session entitled "Multiple-Objective VRP" in MOPGP'17 Conference, Metz, France.
- Member of the Organizing Committee, TORS'16: *2nd Annual Meeting of the Tunisian Operational Research Society*, December 16-18, 2016, Sousse, Tunisia.
- Attended the *5th International Procurement and Supply Chain Conference*, December 2017, Riyadh, KSA.
- Review several internal research grant proposals for Effat University, KSA.
- Reviewer for "*European Journal of Operational Research*", "*IET Intelligent Transport Systems Journal*", "*SpringerPlus*", "*Flexible Services and Manufacturing*", "*International Network Optimization Conference*" INOC'13 and MajecSTIC 2012.
- Vice-general secretary of the Tunisian Operational Research Society executive board, June 2015-June 2017.
- Member of the organizing committee of the "*2nd Annual Tunisian Operational Research Society Conference*" TORS 2016, December 2016, Sousse, Tunisia.
- Member of the organizing committee of the "*1st Annual Tunisian Operational Research Society Conference*" TORS 2015, 12-14 June 2015, Sousse, Tunisia.
- Vice-president of the scientific committee of the "*Ninth event of Young Researchers in Science and Technology of Information and Communication*" MajecSTIC 2012, 29-31 October 2012, Lille, France.
- Member of Alfaisal University Research Committee.
- Member of Alfaisal University Undergraduate Committee.
- Member of GDR MACS Operations Research.
- Member of CIRRELT.
- Member of ROADEF - Société Française de Recherche Opérationnelle et Aide à la Décision.

Skills

Optimization: CPLEX (Callable Library, Concert Technology, Interactive Optimizer).

Statistical: EIEWS, SPSS.

Experiments design: Design-Expert, R.

Programming languages: C, Java, Visual Basic for Applications.

Integrated development environment: Visual Studio, Eclipse.

Other knowledge: Procedural Programming, Object Oriented Programming, Artificial Intelligence.

Bibliographic management software: Pack Office, L^AT_EX.

Languages: French, English, Arabic.

Continuous Training

- "*Design of experiments, R software*", Lille, France, 10/2012.
 - Thematic School, "*Polyhedral and Combinatorial Optimization in Supply Chain*", Valenciennes, France, 06/2011.
 - "*Java programming language*", 30 hours, Research Unit LOGIQ, University of Sfax, 03-04/2010.
 - "*Algorithms, data structures and language programming applied to operational research*", 110 hours, Research Unit LOGIQ, University of Sfax, 2009-2010.
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References available upon request

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