FABRICIO OLIVEIRA

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PROFESSIONAL OBJECTIVES

To further my 5+ years of academic experience, and teaching and research skills. I aim to achieve this through high-quality teaching and supervising at graduate and undergraduate levels, and the development of excellent research aimed at narrowing the gap between academia and industry.

AREAS OF INTEREST

Business Analytics, Operational Research, Optimisation under Uncertainty, Decision Analysis, Mathematical Programming, Supply Chain Management, Transportation and Logistics, Production and Operations Planning.

EDUCATION

Doctor of Science in Production Engineering, Pontifical Catholic University of Rio de Janeiro, Brazil.

Main fields: Transportation and Logistics, Operational Research.

Thesis title: Petroleum Supply Chain Investment Planning under Uncertainty: Models and Algorithms

Bachelor of Science in Industrial Engineering, Pontifical Catholic University of Rio de Janeiro, Brazil.

LANGUAGE COMMAND

Command with fluency: English and Portuguese (native speaker);

Sufficient control for basic communication: Spanish.

SKILLS AND COMPETENCES

Programming: Matlab, Python, Julia, C/C++, Visual Basic.
Mathematical Programming: AIMMS, XPRESS, GAMS, AMPL.
Miscellaneous: Latex, UNIX, Microsoft Office, SQL (Oracle, MS SQL Server).

PRIZES AND AWARDS

- ABEPRO[1] Award for student's Best Doctoral Dissertation, Brazil, 2016
- ARC Postdoctoral Fellowship - Mathematical Sciences - School of Science, RMIT, Australia, 2015;
- Finalist student's paper at the Scientific Initiation Award in the XLVII SBPO[2], Brazil, 2015;
- Scientific Initiation Award: best student's paper presented in the XLV SBPO, Brazil, 2013;
- Finalist paper at the IFORS Prize in OR for Development, 2011;
- Roberto Diéguez Galvão Award: best paper presented in the XLIII SBPO, Brazil, 2011;
- National Research Council (CNPq) International Internship Scholarship, 2011;
- National Research Council (CNPq) Doctorate Scholarship, 2009–2012;
- Academic Excellence in Engineering Degree, Centre of Sciences and Technology, Pontifical Catholic University of Rio de Janeiro, Brazil, 2005, 2006, 2007, and 2008.

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[1] Associação Brasileira de Engenharia de Produção (Brazilian Association of Production Engineering)

[2] Simpósio Braslleiro de Pesquisa Operacional (Brazilian Symposium of Operational Research)

PROFESSIONAL EXPERIENCE

I) Academia

Assistant Professor of Operations Research

Department of Mathematics and Systems Analysis, School of Science, Aalto University, Finland. (09/2017 - present day)

Postdoctoral Research Fellow

Mathematical Sciences, School of Science, RMIT University, Australia. (10/2015 - 08/2017)
Supervisors: Prof. Andrew Eberhard, Prof. Natashia Boland, Prof. Jeffrey Linderoth.
Project: Decomposition and Duality: New Approaches to Integer and Stochastic Integer Programming - Australian Research Council Discovery Grant.
Other administrative activities: coordination of the RMITOpt (www.rmitopt.org) group, securing funds and organising research-oriented events.

Assistant Professor of Production Planning and Logistics

Industrial Engineering Department, PUC-Rio, Brazil. (01/2013 - 10/2015)

Teaching Experience (Year.Semester)

1. **Decision Analysis and Risk** (2013.1, 2013.2, 2014.1, 2014.2)
   Main topics: Decision Theory, Decision Trees, Sensitivity Analysis, Risk Analysis, Risk Measures, Utility Theory; total contact hours: 60h.
2. **Operational Research I** (2014.1, 2014.2, 2015.1)
   Main topics: Mathematical Modelling, Linear and Integer Programming, Network methods; total contact hours: 45h.
3. **Optimisation Techniques** (2014.1, 2015.1)
   Main topics: Mathematical Programming, Linear Programming, Nonlinear Programming, Integer Programming, and Decomposition Methods; total contact hours: 45h.
4. **Optimisation under Uncertainty and Risk (Ph.D. students only)** (2013.2, 2014.2)
   Main topics: Stochastic Programming, Scenario Generation, Risk Management, Robust Programming, and Decomposition Methods, total contact hours: 45h.
5. **Quantitative Methods and Heuristics** (MBA classes from 2010 to 2015)
   Main topics: Mathematical Modelling, Linear Programming, Integer Programming, and Local Search Methods (Meta heuristics); total contact hours: 45h.

Research Supervision: 4 D.Sc., 14 M.Sc., and 8 B.Sc. students.

Other administrative activities: Deputy Head of Postgraduate course (Research), organising the selection of candidates, awarding of scholarships, providing support to students, and contribute to the development of the strategic plan of the school.

Visiting Scholar

Centre of Advanced Process Design (CAPD), Carnegie Mellon University, USA. (11/2011 - 09/2012)
Supervisor: Prof. Ignacio Grossmann (Rudolph R. and Florence Dean University Professor of Chemical Engineering)

Department of Mathematics, Cardiff University, UK. (02/2015)
Supervisor: Prof. Paul Harper (Professor of Operational Research and Deputy Head of the School of Mathematics)

II) Research & Development

Tecgraf Institute - Supply Chain and Optimisation Group, Brazil.

Technical Adviser (01/2013 – 10/2015)
Project Coordinator (01/2010 – 12/2012)
Senior Consultant (01/2008 – 12/2010)
Consultant (03/2007 – 12/2007)

Research Project Portfolio

Publicly Funded Projects

1. Optimisation under Uncertainty for Designing and Planning Petroleum and Biofuel Production Systems in Brazil financed by FAPERJ (Rio de Janeiro State Research Council – "Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro") under my coordination. Duration: Aug 2013 to Aug 2014. Total funding: R$10k.
2. Planning under Uncertainty applied to Petroleum and Oil Products Distribution Systems, financed by CNPq (Brazilian Research Council – "Conselho Nacional de Desenvolvimento Científico e Tecnológico") under my coordination. Duration: Aug 2014 to Aug 2017. Total funding: R$30k.
3. Deterministic and Stochastic Optimisation applied to the Oil Supply Chain financed by CNPq. In this project I act as a Partner Investigator and it is coordinated by Prof. Silvio Hamacher (PUC-Rio). Duration: Aug 2014 to Aug 2017. Total funding: R$30k.
4. Assessing the efficiency of robust optimisation for tactical capacity planning in ETO supply chains, financed by CNPq. In this project I act as a Partner Investigator and it is coordinated by Dr. Andrea Carvalho (INT - National Institute of Technology, Brazil). Duration: Jan 2017 to Jan 2020. Total funding: R$30k.
5. Decomposition and Duality: New Approaches to Integer and Stochastic Integer Programming: this project (Australian Research Council Grant) consists of the development of mathematically sophisticated methods for solving large-scale optimisation problems under uncertainty. Role: Postdoctoral Research Fellow.

Industrially Funded Projects

1. Oil Rig Fleet Scheduling: development of an integrated decision support system to optimise the scheduling of drilling and completion activities of Brazilian pre-salt layer. Developed in partnership with Petrobras. Length of participation: Mar 2013 to Oct 2015. Role: coordinate the development and test of efficient integer-programming based formulations, as well as efficient data management routines.
2. Biodiesel Supply Chain Design: development of a decision support system to foster social development by designing a biodiesel supply chain based on small family farms in partnership with Petrobras. Project length: Oct 2012 to Dec 2013. Role: coordinate modelling activities and the development of GUI, as well as coordinating project activities.
3. Refinery Operational Planning: development of solution methods for nonlinear non-convex refinery planning models for the Brazilian refineries in partnership with Petrobras. Project length: Sep 2012 to May 2013. Role: develop efficient strategies for solving nonlinear non-convex problems.
4. Logistic Planning of the Integrated Oil Supply Chain: development of a planning model for the optimisation of the integrated oil supply chain in partnership with Petrobras. Project length: Jul 2009 to Nov 2012. Role: coordinate database and GUI development, and deployment activities.
5. Distribution Decision Planning: research project for the development of a corporative decision support system for the Brazilian oil supply chain in partnership with Petrobras. Project length: Jul 2008 to Jul 2009. Role: coordinate the implementation of the Graphical User Interface (GUI) for the already existent mathematical model.
6. Optimisation System for the Natural Gas Production: consultant on the development of a decision support system for the natural gas production using nonlinear programming techniques. The project was developed in partnership with Petrobras. Project length: Aug 2007 to Jul 2008. Role: Improve and analyse the mathematical model and solution routines
7. Strategic Planning of the Integrated Oil Supply Chain: development of a strategic planning model for the Brazilian oil chain in partnership with the Energy Research Company (EPE) – Brazilian Ministry of Mines and Energy. Length of participation: Mar 2007 to Aug 2007. Role: Modelling the oil supply chain and implementing accessibility features.

Research Outputs

Peer-reviewed journals

1. CONDEIXA, L. D.; LEIRAS, A.; OLIVEIRA, F; Disaster relief supply pre-positioning optimization: A risk analysis via shortage mitigation. *International Journal of Disaster Risk Mitigation,* v. 25, p. 238-247, 2017.
2. CARVALHO, A. N.; SCAVARDA, L. F.; OLIVEIRA, F. An optimisation approach for capacity planning: modelling insights and empirical findings from a tactical perspective. *Production*, v. 27, 2017.
3. CUNHA, P; RAUPP, F. M. P., OLIVEIRA, F. Periodic review system for inventory replenishment control for a two-echelon logistics network under demand uncertainty: a two-stage stochastic programming approach. *Pesquisa Operacional,* v. 37 (2), p. 247-276, 2017.
4. CUNHA, P; OLIVEIRA, F.; RAUPP, F. M. P. Optimizing inventory replenishment policies via stochastic programming. *Computers and Industrial Engineering*. v. 107, p. 313-326, 2017.
5. DILLON, M.; OLIVEIRA, F.; ABBASI, B. A Two-Stage Stochastic Programming Model for Inventory Management in the Blood Supply Chain. *International Journal of Production Economics,* v. 187, p. 27-41, 2017.
6. DIZ, G.; OLIVEIRA, F.; HAMACHER, S. Improving maritime inventory routing: application to a Brazilian petroleum case. *Maritime Policy & Management, v. 44,* p.42-61, 2017.
7. CARVALHO, A. N.; OLIVEIRA, F.; SCAVARDA, L. F. Tactical capacity planning in a real-world ETO industry case: a robust optimization approach. *International Journal of Production Economics,* v. 180, p. 158-171. 2016.
8. PEREZ, M.; OLIVEIRA, F.; HAMACHER, S. A new mathematical model for the worker rig scheduling problem. *Pesquisa Operacional,* v. 36 (2), p. 241-257. 2016.
9. OLIVEIRA, F.; NUNES, P.; BLAJBERG, R.; HAMACHER, S. A framework for crude oil scheduling in an integrated terminal-refinery system under supply uncertainty. *European Journal of Operational Research*, v. 252, p. 635-645, 2016.
10. ANDRADE, T.; RIBAS, G.; OLIVEIRA, F. A strategy based on convex relaxation for solving the oil refinery operations planning problem. *Industrial & Engineering Chemistry Research*, v. 55, p. 144-155, 2016.
11. NUNES, P.; OLIVEIRA, F.; HAMACHER, S.; ALMANSOORI, A. Design of a hydrogen supply chain with uncertainty. *International Journal of Hydrogen Energy*, v. 40, p. 16408–16418, 2015.
12. CARVALHO, A. N.; OLIVEIRA, F.; SCAVARDA, L. F. An optimization model for tactical capacity planning in a real-world ETO production setting. *International Journal of Production Economics,* v. 167, p. 187-203, 2015.
13. FIORENCIO, L.; OLIVEIRA, F.; NUNES, P.; HAMACHER, S. Investment planning in the petroleum downstream infrastructure. *International Transactions in Operational Research,* v. 22, p. 339-362, 2015.
14. OLIVEIRA, F.; GROSSMANN, I.E.; HAMACHER S. Accelerating Benders stochastic decomposition for the optimization under uncertainty of the petroleum product supply chain. *Computers and Operations Research*, v. 49, p. 47-58, 2014.
15. VIEIRA, P.; OLIVEIRA, F.; HAMACHER, S.; ROMEIRO, G. Plano estatégico para a produção de biodiesel utilizando mamona através de modelo de programação linear inteira-mista. *Sistemas & Gestão*, v. 9, p. 442-452, 2014.
16. OLIVEIRA, F.; GUPTA, V.; HAMACHER, S.; GROSSMANN, I.E. A Lagrangean decomposition approach for oil supply chain investment planning under uncertainty with risk considerations. *Computers and Chemical Engineering,* v. 50, p. 184-195, 2013.
17. OLIVEIRA, F.; HAMACHER, S. Stochastic Benders decomposition for the supply chain investment-planning problem under demand uncertainty. *Pesquisa Operational,* v. 32, p. 663-678, 2012.
18. OLIVEIRA, F.; HAMACHER, S. Optimization of the petroleum product supply chain under uncertainty: a case study in northern Brazil. *Industrial & Engineering Chemistry Research,* v. 51, p. 4279-4287, 2011.
19. STREET, A.; OLIVEIRA, F.; ARROYO, J. M. Contingency-constrained unit commitment with n - K security criterion: a robust optimization approach. *IEEE Transactions on Power Systems*, v. 26, p. 1581-1590, 2011.
20. DOS SANTOS, S.P; LEAL, J. E.; OLIVEIRA, F. The development of a natural gas transportation logistics management system. *Energy Policy,* v. 39, p. 4774-4784, 2011.
21. LEÃO, R. R. C. C.; HAMACHER, S.; OLIVEIRA, F. Optimization of biodiesel supply chains based on small farmers: a case study in Brazil. *Bioresource Technology*, v. 102, p. 8958-8963, 2011.
22. OLIVEIRA, F.; HAMACHER, S.; ALMEIDA, M. R. Process industry scheduling optimization using genetic algorithm and mathematical programming. *Journal of Intelligent Manufacturing*, v. 22, p. 801-813, 2011.

Book chapters (in Portuguese)

23. OLIVEIRA, F.; HAMACHER, S. **Programação da produção de refinarias utilizando programação matemática e algoritmos genéticos**. In: Silvio Hamacher; Virgílio José Martins Ferreira Filho. (Org.). Aplicações de Pesquisa Operacional na Indústria Internacional de Petróleo e Gás. 1ª.ed. Rio de Janeiro: Elsevier Editora Ltda, 2015, v. 1, p. 239-257.
24. OLIVEIRA, F.; HAMACHER, S. **Gerenciamento da cadeia de distribuição de derivados de petróleo sob incerteza.** In: Silvio Hamacher; Virgílio José Martins Ferreira Filho. (Org.). Aplicações de Pesquisa Operacional na Indústria Internacional de Petróleo e Gás. 1ª.ed. Rio de Janeiro: Elsevier Editora Ltda, 2015, v. 1, p. 279-298.1.

Complete articles published in conference proceedings

25. PLACIDO, F.; OLIVEIRA, F. **A Benders stochastic decomposition approach for the optimization under uncertainty of inventory control considering periodic review** Policy. In: SBPO 2015 - XLVII Simpósio Brasileiro de Pesquisa Operacional, 2015, Porto de Galinhas - PE. Anais do SBPO 2015 - XLVII Simpósio Brasileiro de Pesquisa Operacional, 2015.
26. GOES, G.; OLIVEIRA, F. **Pre-positioning and distribution of emergency supply items considering network resilience: a robust optimization approach.** In: SBPO 2015 - XLVII Simpósio Brasileiro de Pesquisa Operacional, 2015, Porto de Galinhas - PE. Anais do SBPO 2015 - XLVII Simpósio Brasileiro de Pesquisa Operacional, 2015.
27. CUNHA, P. S. A.; OLIVEIRA, F.; RAUPP, F. M. P. **Controle de reposição e estoques de um item com demanda incerta via programação estocástica.** In: SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014, Salvador - Bahia. Anais do SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014.
28. METELLO, C.; OLIVEIRA, F. **A health care facility location and congestion planning optimization model.** In: SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014, Salvador - Bahia. Anais do SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014.
29. MARQUES, L. C.; MACHADO, F. A. P. P.; OLIVEIRA, F.; HAMACHER, S. **Sizing and scheduling resources: a decision support system applied to oil rigs scheduling.** In: SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014, Salvador - Bahia. Anais do SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014.
30. PEREZ, M. A. F.; OLIVEIRA, F.; RAUPP, F. M. P. **Um algoritmo heurístico multiobjetivo baseado no método de Newton para o problema integrado de alocação de recursos e sequenciamento de operações.** In: SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014, Salvador - Bahia. Anais do SBPO 2014 - XLVI Simpósio Brasileiro de Pesquisa Operacional, 2014.
31. ANDRADE, T.; RIBAS, G.; OLIVEIRA, F. **Refinery operational planning: a convex relaxation application.** In: SBPO 2013 - XVL Simpósio Brasileiro de Pesquisa Operacional, 2013, Natal. Anais do SBPO 2013 - XVL Simpósio Brasileiro de Pesquisa Operacional, 2013. p. 3342-3349.
32. OLIVEIRA, F.; HAMACHER, S. **A primal decomposition approach for the supply chain investment planning problem under demand uncertainty.** In: FOCAPO 2012 - Foundations of Computer-AidedProcess Operations / CPC VIII, 2012, Savannah. Proceedings of the FOCAPO 2012 - Foundations of Computer-AidedProcess Operations / CPC VIII, 2012.
33. FIORENCIO, L.; P. M. NUNES; OLIVEIRA, F.; HAMACHER, S. **Análise de investimentos na cadeia de suprimentos downstream da indústria petrolífera: proposta de um modelo de programação linear inteira mista.** In: XVI Congresso Latino-Iberoamericano de Investigacion Operativa / XLIV Simpósio Brasileiro de Pesquisa Operacional, 2012, Rio de Janeiro. Anais do XVI Congresso Latino-Iberoamericano de Investigacion Operativa / XLIV Simpósio Brasileiro de Pesquisa Operacional, 2012.
34. OLIVEIRA, F.; HAMACHER, S. **Application of L-Shaped decomposition techniques for the problem of supply chain investment planning under demand uncertainty.** In: SBPO 2011 - XLIII Simpósio Brasileiro de Pesquisa Operacional, 2011, São Paulo. Anais SBPO 2011 - XLIII Simpósio Brasileiro de Pesquisa Operacional, 2011. p. 3437-3447.
35. OLIVEIRA, F.; LEÃO, R.; HAMACHER, S. **A robust approach for the biodiesel supply chain based on small farmers.** In: SBPO 2010 - XLII Simpósio Brasileiro de Pesquisa Operacional, 2010, Bento Gonçalves. Anais SBPO 2010 - XLII Simpósio Brasileiro de Pesquisa Operacional, 2010.
36. NUNES, P. M.; OLIVEIRA, F.; HAMACHER, S.; HAMACHER, P.; TEIXEIRA, W.; MUNCK, F.. **Análise do planejamento de abastecimento da cadeia de petróleo no Brasil.** In: Rio Oil & Gas Expo and Conference, 2010, Rio de Janeiro. Anais da Rio Oil & Gas Expo and Conference, 2010.
37. C. H. NUNES; OLIVEIRA, F.; DA COSTA, F.; MAZZINI, F.; CAMPOS, F.; CHAVES, J. R.; HAMACHER, S. **Sistema de otimização aplicado ao processamento de gás natural no Espírito Santo.** In: Rio Oil & Gas, 2008, Rio de Janeiro. Anais da Rio Oil & Gas Expo and Conference 2008, 2008.

38. HAMACHER, S.; RIBAS, G.; OLIVEIRA, F. **Um modelo para o planejamento estratégico da cadeia de petróleo.** In: SBPO 2008 - XV Simpósio Brasileiro de Pesquisa Operacional, 2008, João Pessoa. Anais do SBPO 2008 - XV Simpósio Brasileiro de Pesquisa Operacional, 2008. p. 2005-2016.
39. OLIVEIRA, F.; HAMACHER, S. **Desenvolvimento de uma ferramenta gráfica para sistemas de otimização do abastecimento de petróleo e derivados.** In: SBPO 2007 - XXXIX Simpósio Brasileiro de Pesquisa Operacional, 2007, Fortaleza. Anais do SBPO 2007 - XXXIX Simpósio Brasileiro de Pesquisa Operacional, 2007. p. 2080-2090.

Invited Talks, Contributed Talks, and Short Courses

40. OLIVEIRA, F.**;** DANDURAND, B.; CHRISTIANSEN, J.; EBERHARD, A. **Efficiently solving stochastic mixed-integer problems combining Gauss-Siedel and penalty-based methods.** In: 53rd Australia-New Zealand Industrial and Applied Mathematics Conference (ANZIAM 2017), 2017.
41. OLIVEIRA, F.**;** DANDURAND, B.; CHRISTIANSEN, J.; EBERHARD, A. **Penalty-based alternating direction mMethod for solving large-scale mixed-integer stochastic problems.** In: Mathematical Optimisation Down Under (MODU2016), 2016.
42. OLIVEIRA, F. **Stochastic optimization in real-world problems - cases from the oil & gas industry**. In: ASOR Recent Advances, 2016.
43. OLIVEIRA, F. **Tutorial on robust optimisation - modelling aspects and applications**, RMITOpt seminars, RMIT University, Melbourne, Australia, 2016
44. OLIVEIRA, F. **Optimisation under uncertainty (15h)**. Pontifícia Universidade Católica do Rio de Janeiro , Rio de Janeiro, Brazil, 2016.
45. OLIVEIRA, F. **Stochastic optimization in real-world problems - cases from the oil & gas industry,** Maths Colloquia, RMIT University, Melbourne, Australia, 2015
46. OLIVEIRA, F. **Optimisation under uncertainty (15h).** Universidad Tecnologica de Pereira, Pereira, Colombia, 2014.
47. OLIVEIRA, F.; HAMACHER, S. **Short-course on stochastic optimisation (3h)**. XVL Simpósio Brasileiro de Pesquisa Operacional, Natal (RN), Brazil, 2013.
48. OLIVEIRA, F. **Optimisation under uncertainty - models and methods.** Universidad Federal de São Carlos, Sorocaba (SP), Brazil, 2013.
49. OLIVEIRA, F. **Short-course on stochastic optimisation (3h)**. Äbo Academy, Turku, Finland, 2013.
50. OLIVEIRA, F.**;** HAMACHER, S.; NUNES, P. M.; BLAJBERG, R. **A methodology for scheduling an integrated terminal-refinery system under oil supply uncertainty.** In: XXVI EURO, 2013, Roma. Annals of the 26° EURO, 2013.
51. STREET, A.; ARROYO, J. M.; OLIVEIRA, F. **Energy and reserve scheduling under an n-K security criterion via robust optimization.** In: 17th Power Systems Computation Conference (PSCC'11), 2011, Estocolmo. Proceedings of PSCC 2011, 2011.
52. STREET, A.; OLIVEIRA, F.; ARROYO, J. M. **An n-K contingency constrained unit commitment model via robust optimization.** In: XXIV EURO, 2010, Lisboa. Annals of the 24° EURO, 2010.
53. OLIVEIRA, F.; ALMEIDA, M. R.; HAMACHER, S. **Genetic algorithms applied to scheduling and optimization of refinery operations.** In: VI ALIO/EURO Workshop on Applied Combinatorial Optimization, 2008, Buenos Aires. Proceedings of the VI ALIO/EURO Workshop on Applied Combinatorial Optimization, 2008.