

Résumé

Daniel Guimarans

Principal Research Scientist at Amazon

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Full list of publications and work experience can be downloaded [here](#).

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AREAS OF EXPERTISE

Optimisation, Constraint Programming, Heuristics and Metaheuristics, Simulation, Data Analysis, Logistics, Transportation, Routing, Scheduling, Aviation.

EDUCATION

- 2012** **Ph.D.** (Cum Laude) in Computer Science – Autonomous University of Barcelona, Barcelona (Spain).
Dissertation title: *Hybrid Algorithms for Solving Routing Problems*.
- 2007** **M.Sc.** in Industrial Computer Science and Advanced Production Techniques – Autonomous University of Barcelona, Barcelona (Spain).
Dissertation title: *A Decision Support System for the Emergency Services Coordination Problem in a Road Accident*.
- 2005** Bachelor in **Physics** – Autonomous University of Barcelona, Barcelona (Spain).
- 2004** Minor in **Applied Mathematics** – Autonomous University of Barcelona, Barcelona (Spain).

JOB HISTORY

- 2022 – present** **Principal Research Scientist**, Amazon; Luxembourg (Luxembourg).
- 2020 – 2022** **Senior Research Scientist**, Amazon; Luxembourg (Luxembourg).
- 2019 – 2020** **Research Fellow** in Optimisation / Data Science & Artificial Intelligence, Faculty of IT, Monash University; Melbourne (Australia).
- 2015 – 2019** **Senior Researcher - Lecturer**, Aviation Academy, Amsterdam University of Applied Sciences; Amsterdam (Netherlands).
- 2013 – 2015** **Researcher**, Optimisation Research Group and Infrastructure, Transport and Logistics Group, National ICT Australia (NICTA); Sydney (Australia).
- 2012 – 2013** **Postdoctoral Researcher / Adjunct Lecturer**, Department of Telecommunications and Systems Engineering, Autonomous University of Barcelona; Barcelona (Spain).
- 2007 – 2012** **PhD Student / Adjunct Lecturer**, Department of Telecommunications and Systems Engineering, Autonomous University of Barcelona; Barcelona (Spain).
- 2005 – 2007** **Research Assistant / Adjunct Lecturer**, Department of Telecommunications and Systems Engineering, Autonomous University of Barcelona; Barcelona (Spain).

INDUSTRY RESEARCH PROJECTS

- 2019** **Peak-hour Passenger Shifting to Reduce Congestion in Melbourne's Rail Network**, Monash University and Public Transport of Victoria (PTV), Melbourne (Australia).

- 2018** **U-SMILE: Data Analysis and Simulation of Amsterdam’s Green Taxi Fleet**, Amsterdam University of Applied Sciences and Amsterdam City Council, Amsterdam (Netherlands).
- 2015** **Analysis of Impact of the New Light Rail System in Canberra’s City Centre Traffic**, NICTA (Optimisation Research Group) and Australian Capital Territory (ACT) Government, Canberra (Australia).
- 2014** **Pilot Productivity in the Virgin Australia E190 Fleet**, NICTA (Optimisation Research Group) and Virgin Australia, Sydney (Australia).
- 2013 – 2014** **Simulation and Analysis of Container Freight Train Operations at Port Botany**, NICTA (Optimisation Research Group) and NSW Ports (Sydney Ports Corporation), Sydney (Australia).

ACADEMIC RESEARCH PROJECTS

- 2011 – 2014** **HAROSA@IB: Iberoamerican Network for algorithms, open source software and distributed computing for solving routing, scheduling and availability problems**, Open University of Catalonia, Barcelona (Spain).
- 2011 – 2014** **Simulation and Optimisation of Logistics and Manufacture Systems**, National Autonomous University of Mexico, Mexico City (Mexico).
- 2005 – 2013** **LOGISIM: Modelling, Simulation and Optimisation of Logistics Systems**, Autonomous University of Barcelona, Barcelona (Spain).
- 2009 – 2012** **Hybrid algorithms for solving realistic routing, scheduling and availability problems**, Open University of Catalonia, Barcelona (Spain).

AWARDS AND HONOURS

- 2016** **Media citations** in *The Sydney Morning Herald*, *The Australian* and *Lloyd’s List*. Featured article in *The Conversation*.
Cited work: Daniel Guimarans, Daniel Harabor, Pascal Van Hentenryck. Simulation and Analysis of Container Freight Train Operations at Port Botany. Available in arXiv.
- 2014** **Best Industry Project, NICTA**.
Awarded work: Capacity Assessment of Port Botany
Authors: Daniel Guimarans, Daniel Harabor, Pascal Van Hentenryck
- 2008** **Sant Jordi Award 2008: Best Information Technology Master Thesis**, *Societat Catalana de Tecnologia (Catalan Technology Society) – Catalan Government*.
Awarded work: A Decision Support System for the Emergency Services Coordination Problem in a Road Accident

JOURNAL ARTICLES (SELECTION)

- Yagmur S. Gok, Silvia Padrón, Maurizio Tomasella, Daniel Guimarans, Cemalettin Ozturk. Constraint-based Robust Planning and Scheduling of Airport Apron Operations through Simheuristics. **Annals of Operations Research**. *In press*, 2022.
- Daniel Guimarans, Silvia Padrón. A Stochastic Approach for Planning Airport Ground Support Resources. **International Transactions in Operational Research**, 29 (6), pp. 3316–3345, 2022.
- Carlos L. Quintero-Araujo, Daniel Guimarans, Àngel A. Juan. A Simheuristic Algorithm for the Capacitated Location Routing Problem with Stochastic Demands. **Journal of Simulation**, 15 (3), pp. 217–234, 2021.
- Daniel Guimarans, Oscar Domínguez, Javier Panadero, Àngel A. Juan. A Simheuristic Approach for the Two-Dimensional Vehicle Routing Problem with Stochastic Travel Times. **Simulation Modelling Practice and Theory**, 89, pp. 1–14, 2018.

- Oscar Domínguez, Daniel Guimarans, Àngel A. Juan, Ignacio de la Nuez. A Biased-Randomised Large Neighbourhood Search for the Two-Dimensional Vehicle Routing Problem with Backhauls. **European Journal of Operational Research**, 255, pp. 442–462, 2016.
- Silvia Padrón, Daniel Guimarans, Juan José Ramos, Salma Fitouri-Trabelsi. A Bi-objective Approach for Scheduling Ground Handling Vehicles in Airports. **Computers & Operations Research**, 71, pp. 34–53, 2016.
- Albert Ferrer, Daniel Guimarans, Helena Ramalhinho, Àngel A. Juan. A BRILS Metaheuristic for Non-Smooth Flow-Shop Problems with Failure-Risk Costs. **Expert Systems with Applications**, 44, pp. 177–186, 2016.
- Àngel A. Juan, Iñaki Pascual, Daniel Guimarans, Barry Barrios. Combining Biased Randomization with Iterated Local Search for Solving the Multi-depot Vehicle Routing Problem. **International Transactions in Operational Research**, 22 (4), pp. 647–667, 2015.
- José Cáceres-Cruz, Pol Arias, Daniel Guimarans, Daniel Riera, Àngel A. Juan. Rich Vehicle Routing Problem: Survey. **ACM Computing Surveys**, 47 (2), pp. 1–28, 2014.

BOOKS AND BOOK CHAPTERS

- Daniel Guimarans, Pol Arias, Maurizio Tomasella, Cheng-Lung Wu. A review of sustainability in aviation: a multidimensional perspective. In Javier Faulin, Scott Grasman, Àngel A. Juan, Patrick Hirsch (Eds.), *Sustainable Transportation and Smart Logistics*, Chapter 4 (pp. 91-121). ISBN 978-0-128-14242-4. Elsevier, 2019.
- Miguel Mújica Mota, Idalia Flores, Daniel Guimarans (Eds.). *Applied Simulation and Optimization: In Logistics, Industrial and Aeronautical Practice*. ISBN 978-3-319-15032-1. Springer, 2015.
- Daniel Guimarans, Pol Arias, Miguel Mújica Mota. Large Neighbourhood Search and simulation for disruption management in the airline industry. In Miguel Mújica Mota, Idalia Flores, Daniel Guimarans (Eds.), *Applied Simulation and Optimization: In Logistics, Industrial and Aeronautical Practice*, Chapter 6 (pp. 169–201). ISBN 978-3-319-15032-1. Springer, 2015.
- Daniel Guimarans, Rosa Herrero, Juan José Ramos, Silvia Padrón. Solving vehicle routing problems using constraint programming and lagrangian relaxation in a metaheuristics framework. In John Wang (Ed.), *Management Innovations for Intelligent Supply Chains*, Chapter 7 (pp. 123–143). ISBN 978-1-466-62461-0. IGI Global, 2013.

ARTICLES IN PROCEEDINGS (SELECTION)

- Yagmur S. Gok, Daniel Guimarans, Peter J. Stuckey, Maurizio Tomasella, Cemalettin Ozturk. Robust resource planning for aircraft ground operations. In proceedings of *International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR 2020)*. Online venue; September, 2020.
- John M. Betts, David L. Dowe, Daniel Guimarans, Daniel D. Harabor, Heshan Kumarage, Peter J. Stuckey, Michael Wybrow. Peak-hour rail demand shifting with discrete optimisation. In proceedings of *International Conference on Principles and Practice of Constraint Programming (CP 2019)*. Stamford, USA; October, 2019.
- Daniel Guimarans, Oscar Domínguez, Àngel A. Juan, Enoc Martínez. A multi-start simheuristic for the stochastic two-dimensional vehicle routing problem. In proceedings of *Winter Simulation Conference (WSC 2016)*. Washington, USA; December, 2016.
- Daniel Guimarans, Silvia Padrón, Juan José Ramos, Salma Fitouri-Trabelsi. Scheduling ground-handling services: a bi-objective approach. In proceedings of *International Conference on Applied Operational Research (ICAOR)*. Vienna, Austria; July, 2015.
- Daniel Guimarans, Rosa Herrero, Daniel Riera, Àngel A. Juan, Juan José Ramos. Combining Constraint Programming, Lagrangian Relaxation and probabilistic algorithms to solve the Vehicle

Routing Problem. In proceedings of *RCRA International Workshop 2010 (CP-AI-OR'10)*. Bologna, Italy; June, 2010.

CONFERENCE AND WORKSHOP PRESENTATIONS (SELECTION)

- Daniel Guimarans. A Constraint Programming approach for the airport gate assignment problem considering regular and disrupted operations. *Conference of the International Federation of Operational Research Societies (IFORS) 2017*. Quebec City, Canada; July, 2017.
- Daniel Guimarans, Pol Arias, Gilbert Laporte. A hybrid approach for the two-dimensional vehicle routing problem with balanced load (2BL-VRP). *Conference of the International Federation of Operational Research Societies (IFORS) 2017*. Quebec City, Canada; July, 2017.
- Daniel Guimarans, Hanna Grzybowska. Real-Time Field Service Engineer Scheduling Problem with Emergencies and Collaborations: a Simulation-Optimisation Approach. *European Conference on Operational Research (EURO)*. Poznań, Poland; July, 2016.
- Philip Kilby, Ignasi Abio, Daniel Guimarans, Daniel Harabor, Patrik Haslum, Valentin Mayer-Eichberger, Fazlul Siddiqui, Sylvie Thiebaut, Tommaso Urli. There's more than one way to solve a long-haul transportation problem. *EURO Working Group on Vehicle Routing and Logistics Optimization (VeRoLog)*. Vienna, Austria; June, 2015.
- Daniel Guimarans, Daniel Harabor, Pascal Van Hentenryck. A simulation approach to analyse rail capacity at Sydney's Port Botany. *Conference of the International Federation of Operational Research Societies (IFORS) 2014*. Barcelona, Spain; July, 2014.

SOFTWARE LICENSES

- 2010** *ITSLogisim Optimisation Suite 1.0*, Autonomous University of Barcelona, Barcelona (Spain). Licensed company: Digital Aeronautics Engineering Services. Optimisation platform for solving vehicle routing problems with additional side constraints.
- 2010** *ITSLogisim Simulation Suite 1.0*, Autonomous University of Barcelona, Barcelona (Spain). Licensed company: Digital Aeronautics Engineering Services. Distributed simulation / optimisation platform for solving road transportation problems.

SUPERVISED PHD THESES

- Grad. 2021** Yagmur Simge Gok. University of Edinburgh.
- Grad. 2021** David Raba. Open University of Catalonia / UBIKWA (Industry PhD).
- Grad. 2014** Silvia Padrón. Autonomous University of Barcelona.

PROFESSIONAL AND EDITORIAL ACTIVITIES

- Conference Program Committee / Reviewer for International Joint Conference on Artificial Intelligence (IJCAI), Winter Simulation Conference (WSC), Metaheuristics International Conference (MIC), Transportation Research Board (TRB) Annual Meeting, European Modelling and Simulation Symposium (EMSS), Australasian Transport Research Forum (ATRF), International Conference on Air Transport (INAIR).
- Reviewer for European Journal of Operational Research, Applied Soft Computing, Annals of Operations Research, Operational Research, Simulation Modelling Practice and Theory, International Journal of Simulation and Process Modelling, Simulation: Transactions of The Society for Modeling and Simulation International, Mathematical Problems in Engineering, IEEE Computational Intelligence Magazine, Journal of Air Transport Management, Journal of Computer Science.