Alberto Santini

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Affiliation	Universitat Pompeu Fabra, Spain
	Department of Economics and Business
	Tenure-track assistant professor and "Juan de la Cierva" researcher
Other affiliations	Barcelona School of Management, Spain
	Professor
	Barcelona Graduate School of Mathematics, Spain
	Affiliate professor
	Barcelona Graduate School of Economics, Spain
	Affiliate professor
	RWTH Aachen University Business School, Germany
	Lecturer

Past Positions

2017	RWTH Aachen, Germany
	Deutsche Post Chair for the Optimisation of Distribution Networks
	Postdoctoral Researcher, under Prof. Michael Schneider

Education

2014–16	University of Bologna, Italy
	Ph.D. in Automatic Control and Operational Research
	Supervisors: Silvano Martello, Daniele Vigo
2011–13	University of Copenhagen, Denmark
	M.Sc. in Mathematics, part of the Master of Excellence programme
	Thesis advisors: Stefan Røpke and Louise Kallehague. Mark: 12/12
2008–10	University of Catania, Italy
	B.Sc. in Mathematics
	Thesis advisor: Angelo Bella. Mark: 110/110 summa cum laude
2002–07	Liceo Scientifico "A. Volta", Caltanissetta, Italy
	Scientific Diploma
	Mark: 100/100

Publications Journal papers

2021
1. Christian Blum, Marko Djukanovic, Alberto Santini, Hua Jiang, Chu-Min Li, Felip Manyà, and Günter Raidl (2021). "Solving common longest subsequence problems via a transformation to the maximum clique problem". In: *Computers & Operations Research* 125. DOI: 10.1016/j.cor.2020.105089

2. Alberto Santini, Michael Schneider, Enrico Bartolini, and Vinicius Greco de Lemos (2021). "The crop growth scheduling problem in vertical farming". In: *European Journal of Operational Research*. DOI: 10.1016/j.ejor.2021.01.034

2020
3. Alberto Santini (2020). "Optimising the assignment of swabs and reagents for PCR testing during a viral

epidemic". In: *Omega*. DOI: 10.1016/j.omega.2020.102341

4. Renata Turkeš, Kenneth Sörensen, Lars Magnus Hvattum, Eva Barrena, Hayet Chentli, Leandro Coelho, Iman Dayarian, Axel Grimault, Anders Gullhav, Çağatay Iris, Merve Keskin, Alexander Kiefer, Richard Martin Lusby, Geraldo Regis Mauri, Marcela Monroy-Licht, Sophie Parragh, Juan-Pablo Riquelme-Rodríguez, Alberto Santini, Vínicius Gandra Martins Santos, and Charles Thomas (2020). "Data for a meta-analysis of the adaptive layer in adaptive large neighborhood search". In: *Data in Brief* 33. DOI: 10.1016/j.dib.2020.106568

2019

5. Alberto Santini (2019). "An Adaptive Large Neighbourhood Search algorithm for the Orienteering Problem". In: *Expert Systems with Applications* 123, pp. 154–167. DOI: 10.1016/j.eswa.2018.12.050

6. Denis Cornaz, Fabio Furini, Enrico Malaguti, and Alberto Santini (2019). "A note on selective line-graphs and partition colorings". In: *Operations Research Letters* 47 (6), pp. 565–568. DOI: 10.1016/j.orl.2019.08.005

2018

7. Enrico Malaguti, Silvano Martello, and Alberto Santini (2018). "The Traveling Salesman Problem with Pickups, Deliveries, and Draft Limits". In: *Omega* 74, pp. 50–58. DOI: 10.1016/j.omega.2017.01.005

8. Fabio Furini, Enrico Malaguti, and Alberto Santini (2018). "An Exact Algorithm for the Partition Coloring Problem". In: *Computers & Operations Research* 92, pp. 170–181. DOI: 10.1016/j.cor.2017.12.019

9. Alberto Santini, Stefan Ropke, and Lars Magnus Hvattum (2018). "A comparison of acceptance criteria for the Adaptive Large Neighbourhood Search metaheuristic". In: *Journal of Heuristics* 24 (5), pp. 783–815. DOI: 10.1007/s10732-018-9377-x

2017

10. Alberto Santini, Stefan Ropke, and Christian E.M. Plum (2017). "A branch-and-price approach to the Feeder Network Design Problem". In: *European Journal of Operational Research* 264 (2), pp. 607–622. DOI: 10.1016/j.ejor.2017.06.063

11. Andrea Bettinelli, Alberto Santini, and Daniele Vigo (2017). "A real-time conflict solution algorithm for the Train Rescheduling Problem". In: *Transportation Research Part B: Methodological* 106, pp. 237–265. DOI: 10.1016/j.trb.2017.10.005

2015

12. Alberto Santini, Henrik Alsing Friberg, and Stefan Ropke (2015). "A note on a model for quay crane scheduling with non-crossing constraints". In: *Engineering Optimization* 47.6, pp. 860–865. DOI: 10.1080/0305215X.2014.958731

Publications Submitted papers

2021

1. Alberto Santini, Ana Viana, Xenia Klimentova, and João Pedro Pedroso (2021). "The probabilistic Travelling Salesman Problem with crowdsourcing". In: *Preprint (submitted)*. URL: https://santini.in/files/papers/santini-viana-klimentova-pedroso-2020.pdf

2. Alberto Santini, Michael Schneider, Thibaut Vidal, and Daniele Vigo (2021). "Decomposition strategies for vehicle routing heuristics". In: *Preprint (submitted)*. URL: https://santini.in/files/papers/santini-schneider-vidal-vigo-2021.pdf

3. Michele Monaci, Ciara Pike-Burke, and Alberto Santini (2021). "The time-bomb knapsack problem". In: *Preprint (submitted)*. URL: https://santini.in/files/papers/monaci-pike-burke-santini-2021.pdf

Publications In preparation

2021

4. Alberto Santini, Stefan Ropke, and Lars-Magnus Hvattum (2021). "Parallel Adaptive Large Neighbourhood Search". In: *In preparation*

5. Alberto Santini (2021). "Differential privacy and optimisation: an introduction and short survey". In: *In preparation*

6. Alberto Santini and Maxence Delorme (2021). "Energy efficient automated Vertical Farming systems". In: *In preparation*

Technical Reports

2015   7. Valentina Cacchiani, Alberto Santini, and Daniele Vigo (2015). *A study on metaheuristic approaches to the energy-efficient Train Timetabling Problem*. Tech. rep. OR-15-6. DEI, University of Bologna

2014   8. Valentina Cacchiani, Alberto Santini, and Daniele Vigo (2014). *A novel modelling approach to the Train Timetabling Problem*. Tech. rep. OR-14-27. DEI, University of Bologna

Conference Talks

2020   9. Alberto Santini and Ana Viana (2020). "Crowdsourcing in last-mile delivery: machine learning and heuristic approaches to the Stochastic TSP with Crowdsourcing". In: *5th Conference of Young Researchers of the Royal Spanish Society of Mathematics and Statistics*

     10. Alberto Santini, Ana Viana, Xenia Klimentova, and João Pedro Pedroso (2020). "Machine learning and heuristic approaches to the Probabilistic TSP with Crowdsourcing". In: *4th AIROYoung Workshop*

2018   11. Alberto Santini and Christian Blum (2018). "Solving a class of longest subsequence problems via maximum cliques". In: *ODS Conference*

     12. Alberto Santini (2018b). "An ALNS heuristic for the Orienteering Problem". In: *EURO Conference*

     13. Alberto Santini (2018a). "A hybrid Machine Learning and ALNS approach to the Orienteering Problem". In: *EURO/ALIO Conference*

2017   14. Fabio Furini, Enrico Malaguti, and Alberto Santini (2017). "Exact and heuristic algorithms for the partition colouring problem". In: *ODS Conference*

2016   15. Alberto Santini, Stefan Ropke, and Lars Magnus Hvattum (2016b). "Poster: A comparison of acceptance criteria for the ALNS metaheuristic". In: *AIRO Conference*

     16. Alberto Santini, Stefan Ropke, and Lars Magnus Hvattum (2016a). "A comparison of acceptance criteria for the Adaptive Large Neighbourhood Search metaheuristic". In: *EURO Conference*

2015   17. Enrico Malaguti, Silvano Martello, and Alberto Santini (2015). "A maritime version of the Travelling Salesman Problem". In: *Odysseus Conference*

     18. Alberto Santini, Stefan Ropke, and Christian E.M. Plum (2015). "A rich maritime extension of the Vehicle Routing Problem". In: *AIRO Conference*

2014   19. Enrico Malaguti, Silvano Martello, and Alberto Santini (2014). "The Travelling Salesman Problem with pickup, delivery and draught limits". In: *AIRO Conference*

Awards

2018   Omega best paper award
Won the Best Paper Award for a paper published during 2018 in the journal Omega. The paper was "The Traveling Salesman Problem with Pickup, Deliveries, and Draft Limits".

Grants Personal or as P.I., competitive

2020–21   Planetary Wellbeing research grant
PI of a research proposal with Gara Villalba (Universitat Autonoma de Barcelona) and Michael Schneider (RWTH Aachen University), on the optimisation of vertical farming in Barcelona's public schools. Grant awarded by Universitat Pompeu Fabra.

2018–20   Juan de la Cierva Formación
Two-year grant from the Spanish government. Ranked 1st out of 49 participants from all areas of Mathematics, with a score of 99/100.

2014–16   Ph.D. grant by the University of Bologna

Ranked 1st out of 9 participants, with a score of 92/100.

Grants As part of a group, competitive

2019   I+D+i 2019 (Retos)
Part of the group awarded for the project "Optimización logística para el cuidado de la salud en el hogar y los servicios sociales" by the Spanish Ministry of Science.

2016   PRIN (Research Projects of Relevant National Interest) 2016
Part of the group awarded for the project "Transportation and Logistics Optimization in the Era of Big and Open Data".

Grants Other

2019   Yerun Mobility Award
To visit University Paris Dauphine, sponsored by YERUN.

2018–2023   Association of European Operational Research Societies (EURO)
Grant to organise the EUROYoung Workshops.

2018   Erasmus+ Grant
To visit the University of Bologna, through the SmartTransLog consortium.

2017   COST STSM Grant
Short-Term Scientific Mission grant to conduct research at INESC-TEC under COST Action "European Network for Collaboration on Kidney Exchange Programmes".

2016   Association of European Operational Research Societies (EURO)
Grant to organise the "EURO Young Researchers OR Webinars".

2015   Marco Polo scholarship
Grant to conduct research abroad.

Teaching Ph.D. level

2020–21   Business Analytics for Operations and Marketing
Taught in a team. Universitat Pompeu Fabra, first-year course for Ph.D. students (M.Res. in Economics, Finance and Business).

2018–21   Research Seminars
Taught in a team. Universitat Pompeu Fabra, first-year course for Ph.D. students (M.Res. in Economics, Finance and Business).

Teaching Master's level

2019–21   Practical Data Science for Management
Barcelona School of Management, Universitat Pompeu Fabra, M.Sc. in Management.

2019–21   Advanced Machine Learning
RWTH Business School, M.Sc. in Data Analytics and Decision Science.

2018–19   Data Science Projects
RWTH Business School, M.Sc. in Data Analytics and Decision Science.

2018–21   Machine Learning
RWTH Business School, M.Sc. in Data Analytics and Decision Science.

2017   Optimisation methods for Big Data Analytics
RWTH Aachen, Master's in Management, Business, and Economics.

2014–18   Optimisation Algorithms (teaching assistant)

Course taught by Paolo Toth.
University of Bologna, M.Eng. in Computer Engineering.

Teaching Bachelor's level

2021   Applied Machine Learning and Optimisation
Universitat Pompeu Fabra, elective course for all last-year Bachelor's students of the Department of Economics.

2020   Applied Optimisation Techniques
Universitat Pompeu Fabra, elective course for all last-year Bachelor's students of the Department of Economics.

2019   Revenue Management and Dynamic Pricing
Universitat Pompeu Fabra, elective course for all last-year Bachelor's students of the Department of Economics.

2018–21   Operations Management
Universitat Pompeu Fabra, Bachelor's in International Business Economics.

2018–19   Operations Management
Universitat Pompeu Fabra, Bachelor's in Business Management Administration.

2016–17   Foundations of OR (teaching assistant)
Course taught by Enrico Malaguti and Michele Monaci.
University of Bologna, B.Eng. in Management Engineering.

Academic experience Scientific Organisations

2019–2021   Elected member of the Board of Directors
Member of the board of directors of AIRO, the Italian Operational Research Association.

2018   Founder
Founded EUROYoung, a group of young O.R. scientists from EURO member countries, with the aim of organising training events for early-stage researchers.

2016–18   Coordinator
Coordinator of AIROYoung, the youth chapter of the Italian Operational Research Association. During my tenure as coordinator, I organised two workshops securing funding from Italian and European institutions; I created a database of young talents in O.R. and of open positions, helping matching O.R. scientists with relevant opportunities; I helped enroll new young members into AIRO, from Italy and other European countries.

2016   Founder
Founder of AIROYoung, the youth chapter of the Italian Operational Research Association.

Academic experience Organisation of Seminars, Workshops, and Courses

2022   Member of the Organising Committee
The 2nd EUROYoung Workshop. Porto, Portugal, 25–26 June 2022.

2019   Organiser of a PhD and Postdoc course
Organised a course for PhD and Postdocs of the Barcelona Graduate School of Mathematics, titled "An Introduction to Equilibrium Problems and their applications". The course is taught by Mauro Passacantando.

2019   Member of the Organising Committee
The 1st EUROYoung Workshop. Invited speakers: Ana Viana and Federico Perea. Seville, Spain, 2–3 May 2019.

2019   Member of the Organising Committee
The 3rd AIROYoung Workshop and 1st AIROYoung PhD School. Invited speakers: Teodor Crainic and Endre Boros. Rome, Italy, 26–29 Mar 2019.

2018–19   Coordinator of the "Operations and Marketing" seminar series
This is a series of weekly seminars at the Department of Economics and Business of Universitat Pompeu Fabra,

with invited speakers from all over the world.

2018	**Member of the Organising Committee** The 2nd AIROYoung Workshop, on the theme "Logistics optimisation and applied operational research". Invited speakers: Geir Hasle and Roberto Roberti. Cosenza, Italy, 03–05 Mar 2018.
2017	**Workshop Organiser** Organised, together with Lavinia Amorosi, the 1st AIROYoung Workshop, on the theme "Emerging Optimization Problems on Complex Networks". Invited speakers: Justo Puerto and Maria Grazia Scutellà. Rome, Italy, 16–17 Feb 2017.
2016	**EURO Young Researchers OR Webinars Organiser** Organised a series of OR webinars by and for young researchers from all over the world, sponsored by EURO.
2015	**Seminars Organiser** Organised of a series of doctoral seminars within the Operational Research group at DEI, University of Bologna, involving local and visiting researchers.

Academic experience Conferences

2021	**Member of the Programme Committee (ECON track)** GECCO2021, the The Genetic and Evolutionary Computation Conference. Lille, France.
2020	**Member of the Programme Committee** ODS2020, Optimisation and Decision Science 2020 with theme "Optimisation in Artificial Intelligence and Data Science". Rome, Italy.
2020	**Member of the Programme Committee (ECON track)** GECCO2020, the The Genetic and Evolutionary Computation Conference. Cancun, Mexico.
2019	**Member of the Programme Committee (ECON track)** GECCO2019, the The Genetic and Evolutionary Computation Conference. Prague, Czech Republic.
2019	**Member of the Programme Committee** HM2019, the 11th International Workshop on Hybrid Metaheuristics. Concepción, Chile.
2018	**Member of the Organising Committee** and **Session Chair** ODS 2018, Optimisation and Decision Science Conference. Chair of the "AIROYoung" session. Taormina, Italy.
2018	**Session Chair** "EURO Young" session at the EURO 2018 Conference. Valencia, Spain.
2018	**Session Chair** "AIROYoung" session at the EURO/ALIO 2018 Conference. Bologna, Italy.
2017	**Session Chair** "AIROYoung" session at the ODS 2017, Optimisation and Decision Science Conference. Sorrento, Italy.
2016	**Poster Session Chair** "Young OR Researchers Poster Session" at the AIRO 2016 Conference. Trieste, Italy.
2016	**Session Chair** "Methodological advancements in metaheuristics" session at the EURO 2016 Conference. Poznan, Poland.
2015	**Session Chair** "Exact Methods for Routing Problems" at the AIRO 2015 Conference. Pisa, Italy.

Academic experience Evaluation Committees

2020	**Member of PhD defence committees** At several institutions in Europe.

2018	Grant proposal evaluator
	"FONDECYT Initiation into Research" programme, Chilean National Science and Technology Commission.
2018–20	Member of the permanent M.Sc. thesis defence committee
	Master's in Statistics and Operational Research, Polytechnic University of Catalunya, Spain.
	Master's in Management, Barcelona School of Management, Spain.

Academic experience Visiting Positions

2018	University of Bologna, Italy
	Visiting Paolo Toth and Daniele Vigo under an Erasmus+ grant from the SmartTransLog consortium.
2017	INSEC-TEC, Portugal
	Visiting as part of a Short-Term Scientific Mission for COST Action "European Network for Collaboration on Kidney Exchange Programmes". Working with Ana Viana, João Pedro Pedroso, and Xenia Klimentova.
2016	Amazon Inc.
	Visiting Research Scientist in Seattle, USA. Working with Mauricio Resende and Andrew Goldberg.
2016	Vrije Universiteit Amsterdam
	Visiting Ph.D. Student at the Department of Information, Logistics and Innovation. Working with Wout Dullaert.
2015	University of Calabria
	Visiting Ph.D. Student at the Department of Mechanical, Energy and Management Engineering. Working with Demetrio Laganà.
2015	Danish Technical University (DTU)
	Visiting Ph.D. Student at the Department of Management Engineering. Working with Stefan Røpke.

Invited talks

2019	"Crowdsourcing in last-mile delivery: machine learning and heuristic approaches to the Stochastic TSP with Crowdsourcing."
	Invited to present at the seminar series of LAMSADE, University Paris Dauphine.
2016	"A real-time conflict resolution algorithm for the train rescheduling problem."
	Invited to present at: Vrije Universiteit, Amsterdam (Feb 2016); Danish Technical University (DTU), Kongens Lyngby (Oct 2016); DSB Training Centre, Nyborg (Oct 2016).
2015	"TSP with pickups, deliveries, and draught limits."
	University of Bologna. Part of a series of seminars held by Ph.D. students and young researchers.
2014	"Recent trends in Operational Research and practical business applications."
	American University of Armenia; series of two seminars at the College of Science and Engineering.
2014	"Data Enevelopment Analysis and OR applications in measuring efficiency."
	University of Bologna. Part of the course "Resource Optimization", M.Eng. in Management Engineering.

Supervised theses

2020	Master's Thesis, M.Res. in Economics, School of Economics and Business, Universitat Pompeu Fabra
	Co-supervisor, "Imitation, Principal Component Analysis, and the Effects of Modifications to eSports on Competitive Balance", Karim Carroum.
	Master's Thesis, M.Sc. in Management, Barcelona School of Management, Universitat Pompeu Fabra
	Supervisor, "A simulation study of integrated real-time data resulting in a dynamic pricing model for crowdsourcing-to-customer last-mile deliveries", Otis van der Meij.
	Project, M.Sc. in Data Analytics and Decision Science, RWTH Business School
	Supervisor, "COVID-19 Pandemic: Comparison of forecasting methodologies and affecting factors for fatalities

and transmission rates", Peter Yacoub.

Project, M.Sc. in Data Analytics and Decision Science, RWTH Business School
Supervisor, "Machine learning for selective assembly with automatic adaption to use-case complexity", Sourabh Hujare.

Bachelor's Thesis, School of Economics and Business, Universitat Pompeu Fabra
Supervisor, "Congestion tax as the optimal policy tool to minimize congestion in the city of Barcelona", Joel Sanginés-Uriarte Dooly and Adrià Trepat i Izquierdo.

Bachelor's Thesis, School of Economics and Business, Universitat Pompeu Fabra
Supervisor, "Machine Learning for Price Discrimination", Jan Czernek.

2019   Erasmus+ Internship, incoming from the University of Twente
Supervisor, "Production planning and optimisation of vertical farms", Vinicius Greco de Lemos.

Master's Thesis, M.Sc. in Management, Barcelona School of Management, Universitat Pompeu Fabra
Supervisor, "Demand forecasting model in food delivery, a heuristic approach to data science using Python and geoanalysis", Marc Herrera.

2017   Project, M.Sc. in Management, Business, and Economics, RWTH Aachen
Supervisor, "Improving document-level machine translation with `word2vec`", Sean Eulenberg.

Master's Thesis, M.Sc. in Management, Business, and Economics, RWTH Aachen
Co-supervisor, "A heuristic algorithm for the electric pickup and delivery problem", Lutz Venhofen.

2016   Master's Thesis, M.Eng. in Management Engineering, University of Bologna
Co-supervisor, "Embedding robustness in train rescheduling algorithms", Alessandro Morandi.

Project, M.Eng. in Computer Engineering, University of Bologna
Co-supervisor, "A genetic algorithm for real-time energy optimisation of train timetables", Francesco Di Lella.

2015   Master's Thesis, M.Eng. in Management Engineering, University of Bologna
Co-supervisor, "Metaheuristic algorithms for energy optimisation in train timetabling and rescheduling", Hang Xu.

Project, M.Eng. in Computer Engineering, University of Bologna
Co-supervisor, "A constructive heuristic for the dispatching problem on multi-track territories", Giacomo Dall'Olio and Simone Laierno.

2014   Master's Thesis, M.Eng. in Management Engineering, University of Bologna
Co-supervisor, "Valutazione della Performance di un caso di Customer Contact Desk attraverso l'applicazione della metodologia Data Envelopment Analysis", Martina Carli.

Work experience

2016   Amazon
Research Scientist Intern. Seattle, USA.

2012–13   Procter & Gamble
Strategic Sourcing Intern. Bruxelles, Belgium.

2012   WISON Offshore & Marine
Procurement Trainee. Shanghai, China.

2011–12   Amiiko
Ruby on Rails Developer. Copenhagen, Denmark.

Other

Languages   Italian: mothertongue; English: fluent; French: very good; Spanish: very good; Catalan: very good.

Volunteering   Spanish Red Cross; Italian Red Cross; Danish Red Cross; Big Brother / Big Sister Project Kongelunden, Copen-

hagen, Denmark; Associació per la Promoció del Transport Public, Barcelona, Spain.

Certifications   Chartered shipbroker according to Italian law (2012).