

# Alberto Santini

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**Affiliations**    [Universitat Pompeu Fabra, Spain](#)  
Department of Economics and Business  
Tenure-track assistant professor and “Juan de la Cierva” professor  
  
[Barcelona Graduate School of Economics, Spain](#)  
Affiliate professor  
  
[Barcelona Graduate School of Mathematics, Spain](#)  
Affiliate professor

## Past Positions

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

## Education

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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 Kallehauge. 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 (published or submitted)

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- 2020
1. Alberto Santini. “Optimising the assignment of swabs and reagents for PCR testing during a viral epidemic”. In: *Omega (submitted)* (2020)
  2. Christian Blum, Marko Djukanovic, Alberto Santini, Hua Jiang, Chu-Min Li, Felip Manyà, and Günter Raidl. “Solving common longest subsequence problems via a transformation to the maximum clique problem”. In: *Computers & Operations Research (submitted)* (2020)
  3. Alberto Santini, Ana Viana, Xenia Klimentova, and João Pedro Pedroso. “Exact, heuristic and machine learning approaches to the probabilistic travelling salesman problem with crowdsourcing”. In: *Transportation Science (submitted)* (2020)
  4. Alberto Santini, Michael Schneider, and Vinicius Greco de Lemos. “The crop growth scheduling problem in vertical farming”. In: *European Journal of Operational Research (submitted)* (2020)
- 2019
5. Alberto Santini. “An Adaptive Large Neighbourhood Search algorithm for the Orienteering Problem”. In: *Expert Systems with Applications* 123 (2019), pp. 154–167. DOI: 10.1016/j.eswa.2018.12.050
  6. Denis Cornaz, Fabio Furini, Enrico Malaguti, and Alberto Santini. “A note on selective line-graphs and

- partition colorings”. In: *Operations Research Letters* 47 (6 2019), pp. 565–568. DOI: 10.1016/j.orl.2019.08.005
- 2018
7. Enrico Malaguti, Silvano Martello, and Alberto Santini. “The Traveling Salesman Problem with Pickups, Deliveries, and Draft Limits”. In: *Omega* 74 (2018), pp. 50–58. DOI: 10.1016/j.omega.2017.01.005
  8. Fabio Furini, Enrico Malaguti, and Alberto Santini. “An Exact Algorithm for the Partition Coloring Problem”. In: *Computers & Operations Research* 92 (2018), pp. 170–181. DOI: 10.1016/j.cor.2017.12.019
  9. Alberto Santini, Stefan Ropke, and Lars Magnus Hvattum. “A comparison of acceptance criteria for the Adaptive Large Neighbourhood Search metaheuristic”. In: *Journal of Heuristics* 24 (5 2018), pp. 783–815. DOI: 10.1007/s10732-018-9377-x
- 2017
10. Alberto Santini, Stefan Ropke, and Christian E.M. Plum. “A branch-and-price approach to the Feeder Network Design Problem”. In: *European Journal of Operational Research* 264 (2 2017), pp. 607–622. DOI: 10.1016/j.ejor.2017.06.063
  11. Andrea Bettinelli, Alberto Santini, and Daniele Vigo. “A real-time conflict solution algorithm for the Train Rescheduling Problem”. In: *Transportation Research Part B* 106 (2017), pp. 237–265. DOI: 10.1016/j.trb.2017.10.005
- 2015
12. Alberto Santini, Henrik Alsing Friberg, and Stefan Ropke. “A note on a model for quay crane scheduling with non-crossing constraints”. In: *Engineering Optimization* 47.6 (2015), pp. 860–865. DOI: 10.1080/0305215X.2014.958731

## Publications In preparation

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- 2020
13. Alberto Santini and Maxence Delorme. “Optimising the energy efficiency of an automated vertical farm serviced by elevators”. In: *In preparation* (2020)
  14. Alberto Santini, Michael Schneider, Thibaut Vidal, and Daniele Vigo. “Decomposition strategies for large-scale Vehicle Routing Problems”. In: *In preparation* (2020)
  15. Alberto Santini and Stefan Ropke. “Parallel Adaptive Large Neighbourhood Search”. In: *In preparation* (2020)
  16. Michele Monaci, Ciara Pike-Burke, and Alberto Santini. “The time-bomb knapsack problem”. In: *In preparation* (2020)
  17. Alberto Santini. “Differential privacy and optimisation: an introduction and short survey”. In: *In preparation* (2020)

## Technical Reports

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- 2015
18. Valentina Cacchiani, Alberto Santini, and Daniele Vigo. *A study on metaheuristic approaches to the energy-efficient Train Timetabling Problem*. Tech. rep. OR-15-6. DEI, University of Bologna, 2015
- 2014
19. Valentina Cacchiani, Alberto Santini, and Daniele Vigo. *A novel modelling approach to the Train Timetabling Problem*. Tech. rep. OR-14-27. DEI, University of Bologna, 2014

## Conference Talks

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- 2020
20. Alberto Santini and Ana Viana. “Crowdsourcing in last-mile delivery: machine learning and heuristic approaches to the Stochastic TSP with Crowdsourcing”. In: *5<sup>th</sup> Conference of Young Researchers of the Royal Spanish Society of Mathematics and Statistics*. 2020
  21. Alberto Santini, Ana Viana, Xenia Klimentova, and João Pedro Pedrosa. “Machine learning and heuristic approaches to the Probabilistic TSP with Crowdsourcing”. In: *4<sup>th</sup> AIROYoung Workshop*. 2020
- 2018
22. Alberto Santini and Christian Blum. “Solving a class of longest subsequence problems via maximum cliques”. In: *ODS Conference*. 2018

23. Alberto Santini. “An ALNS heuristic for the Orienteering Problem”. In: *EURO Conference*. 2018
24. Alberto Santini. “A hybrid Machine Learning and ALNS approach to the Orienteering Problem”. In: *EURO/ALIO Conference*. 2018
- 2017 25. Fabio Furini, Enrico Malaguti, and Alberto Santini. “Exact and heuristic algorithms for the partition colouring problem”. In: *ODS Conference*. 2017
- 2016 26. Alberto Santini, Stefan Ropke, and Lars Magnus Hvattum. “Poster: A comparison of acceptance criteria for the ALNS metaheuristic”. In: *AIRO Conference*. 2016
27. Alberto Santini, Stefan Ropke, and Lars Magnus Hvattum. “A comparison of acceptance criteria for the Adaptive Large Neighbourhood Search metaheuristic”. In: *EURO Conference*. 2016
- 2015 28. Enrico Malaguti, Silvano Martello, and Alberto Santini. “A maritime version of the Travelling Salesman Problem”. In: *Odysseus Conference*. 2015
29. Alberto Santini, Stefan Ropke, and Christian E.M. Plum. “A rich maritime extension of the Vehicle Routing Problem”. In: *AIRO Conference*. 2015
- 2014 30. Enrico Malaguti, Silvano Martello, and Alberto Santini. “The Travelling Salesman Problem with pickup, delivery and draught limits”. In: *AIRO Conference*. 2014

## Awards

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- 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

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- 2018–20 [Juan de la Cierva Formación](#)  
Two-year grant from the Spanish government. Ranked 1<sup>st</sup> 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 1<sup>st</sup> out of 9 qualified participants, with a score of 92/100.

## Grants As part of a group, competitive

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- 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

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- 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 Net-

- work 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

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- 2020 [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).
- 2018–20 [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

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- 2019–20 [Practical Data Science for Management](#)  
Barcelona School of Management, Universitat Pompeu Fabra, M.Sc. in Management.
- 2019–20 [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.
- 2018–20 [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

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- 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.
- 2018–20 [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 \(teaching assistant\)](#)  
A-K cohort taught by Enrico Malaguti, L-Z cohort taught by Michele Monaci.  
University of Bologna, B.Eng. in Management Engineering.

## Academic experience Scientific Organisations

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- 2019–2021 [Elected member of the Board of Directors](#)  
Part of the 12-persons 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

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- 2019 [Member of the Organising Committee](#)  
The 2<sup>nd</sup> EUROYoung Workshop. Porto, Portugal, 25–26 June 2020.
- 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 1<sup>st</sup> EUROYoung Workshop. Invited speakers: Ana Viana and Federico Perea. Seville, Spain, 2–3 May 2019.
- 2019 [Member of the Organising Committee](#)  
The 3<sup>rd</sup> AIROYoung Workshop and 1<sup>st</sup> 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 2<sup>nd</sup> 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 1<sup>st</sup> 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

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- 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	<a href="#">Member of the Programme Committee</a> HM2019, the 11 <sup>th</sup> International Workshop on Hybrid Metaheuristics. Concepción, Chile.
2018	<a href="#">Member of the Organising Committee and Session Chair</a> ODS 2018, Optimisation and Decision Science Conference. Chair of the “AIROYoung” session. Taormina, Italy.
2018	<a href="#">Session Chair</a> “EURO Young” session at the EURO 2018 Conference. Valencia, Spain.
2018	<a href="#">Session Chair</a> “AIROYoung” session at the EURO/ALIO 2018 Conference. Bologna, Italy.
2017	<a href="#">Session Chair</a> “AIROYoung” session at the ODS 2017, Optimisation and Decision Science Conference. Sorrento, Italy.
2016	<a href="#">Poster Session Chair</a> “Young OR Researchers Poster Session” at the AIRO 2016 Conference. Trieste, Italy.
2016	<a href="#">Session Chair</a> “Methodological advancements in metaheuristics” session at the EURO 2016 Conference. Poznan, Poland.
2015	<a href="#">Session Chair</a> “Exact Methods for Routing Problems” at the AIRO 2015 Conference. Pisa, Italy.

## Academic experience Evaluation Committees

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2018	<a href="#">Grant proposal evaluator</a> “FONDECYT Initiation into Research” programme, Chilean National Science and Technology Commission.
2018–20	<a href="#">Member of the M.Sc. Thesis Defence Committee</a> Master’s in Statistics and Operational Research, Polytechnic University of Catalunya, Spain.

## Academic experience Visiting Positions

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2018	<a href="#">University of Bologna, Italy</a> Visiting Paolo Toth and Daniele Vigo under an Erasmus+ grant from the SmartTransLog consortium.
2017	<a href="#">INSEC-TEC, Portugal</a> 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	<a href="#">Amazon Inc.</a> Visiting Research Scientist in Seattle, USA. Working with Mauricio Resende and Andrew Goldberg.
2016	<a href="#">Vrije Universiteit Amsterdam</a> Visiting Ph.D. Student at the Department of Information, Logistics and Innovation. Working with Wout Dullaert.
2015	<a href="#">University of Calabria</a> Visiting Ph.D. Student at the Department of Mechanical, Energy and Management Engineering. Working with Demetrio Laganà.
2015	<a href="#">Danish Technical University (DTU)</a> Visiting Ph.D. Student at the Department of Management Engineering. Working with Stefan Røpke.

## Invited talks

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2019	<a href="#">“Crowdsourcing in last-mile delivery: machine learning and heuristic approaches to the Stochastic TSP with Crowdsourcing.”</a> Invited to present at the seminar series of LAMSADE, University Paris Dauphine.
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- 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

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- 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 Sanguinés-Urriarte Dooly and Adrià Trepà 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

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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

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

Volunteering      Italian Red Cross; Danish Red Cross; Big Brother / Big Sister Project Kongelunden, Copenhagen, Denmark; Associació per la Promoció del Transport Public, Barcelona, Spain.

Certifications      Chartered shipbroker according to Italian law (2012).