José Barros

Professor Auxiliar Convidado
ISTAR-Iscte - Information Sciences, Technologies and Architecture Research Centre
Department of Social and Enterprise Sciences (ETDA)

Contacts

E-mail	Jose.Manuel.Barros@iscte-iul.pt

Curriculum

Since 2022, I have taught at Iscte-Sintra — Iscte, University Institute of Lisbon, delivering the modules Graphs and Complex Networks, Mathematical Modelling, Introduction to Neural Networks, Calculus, and Mechanics and Electricity. In parallel, I serve as Coordinator of Projects in Applied Mathematics II and as Year Coordinator for the first year of the Digital Technologies and Management degree programme. Between 2021 and 2023, I also taught the modules Mathematics I and II, Physics I and II, Probability and Statistics, and Computer Science at the Instituto Superior de Educação e Ciências de Lisboa.

I am passionate about science and the advancement of knowledge, with research interests in mathematical modelling applied to Physics, Biology, Sociology, and, more broadly, to scientific and societal challenges. I am equally committed to education, striving to enable students to master any skill with the right guidance and effort. In this spirit, I have volunteered as a teacher of Portuguese and Mathematics for illiterate adults at a social institution, and I currently teach Mathematics at a Senior University.

Beyond academia, I have experience in Data Analysis (back end and front end), Data Visualisation and dashboarding, Data Science, and Predictive Analytics. I excel at problem-solving, research, and data interpretation, applying analytical skills to develop solutions rapidly, whether through organisation, teamwork, planning, management, programming, or innovation.

As a researcher, I have worked on projects that apply mathematical and computational techniques to biological, operational, social, and other data sources. In biological applications, I specifically studied the evolution of viruses in terms of mutations and virulence. Although this research did not prevent the COVID-19 pandemic, projects of this kind contribute to the scientific foundation that enabled the rapid development of vaccines.

I hold a PhD from Cranfield University (UK), following an MSc in Physics from the University of Lisbon (Portugal). My doctoral thesis focused on analysing automotive supply chains and developing a synthetic network model capable of reproducing real-world supply chain structures. The model demonstrated high accuracy, enabling managers to predict supply chain structures with minimal data.

In terms of soft skills, determination and hard work have been fundamental in my career. I firmly believe that success is

not reserved for geniuses — anyone can achieve their goals with dedication and perseverance.

Academic Qualifications

University/Institution	Type	Degree	Period
Universidade Aberta	Other type of qualification	Docência a Distância	2022
Universidade Aberta	Other type of qualification	Docência a Distância	2022
Universidade Aberta	Other type of qualification	Docência a Distância	2022
Cranfield University	PhD	Applied Sciences	2019
Cranfield University	PhD	Applied Sciences	2019
Cranfield University	PhD	Applied Sciences	2019
Universidade de Lisboa Faculdade de Ciências	M.Sc.	Física	2013

External Professional Activities

Period	Employer	Country	Description
2019 - 2021	Siemens	Portugal	Solution design regarding business analysis and data science
2017 - 2019	SDG Group	Portugal	Data analyst consultor

Teaching Activities

Teaching Year	Sem.	Course Name	Degree(s)	Coord.
2025/2026	2º	Electricity and Mechanics	Bachelor Degree in Digital Technologies and Automation;	Yes
2025/2026	2º	Graphs and Complex Networks	Bachelor Degree in Mathematics Applied and Digital Technologies;	Yes
2025/2026	2º	Project in Applied Mathematics II	Bachelor Degree in Mathematics Applied and Digital Technologies;	Yes
2025/2026	2º	Introduction to Neural Networks	Bachelor Degree in Digital Technologies and Artificial Intelligence;	Yes
2025/2026	1º	Calculus	Bachelor Degree in Digital Technologies and Automation; Bachelor Degree in Digital Technologies and Management;	Yes
2025/2026	1º	Mathematics		Yes

2025/2026	1º	Mathematical modelling	Bachelor Degree in Mathematics Applied and Digital Technologies;	Yes
2024/2025	2º	Calculus	Bachelor Degree in Digital Technologies and Automation;	Yes
2024/2025	2º	Applied Mathematics Complements	Bachelor Degree in Digital Technologies and Information Security; Bachelor Degree in Digital Technologies and Health;	No
2024/2025	2º	Project in Applied Mathematics II	Bachelor Degree in Mathematics Applied and Digital Technologies;	No
2024/2025	1º	Calculus	Bachelor Degree in Digital Technologies and Management;	Yes
2024/2025	1º	Graphs and Complex Networks	Bachelor Degree in Mathematics Applied and Digital Technologies;	Yes
2024/2025	1º	Mathematics	Bachelor Degree in Politics, Economics and Society;	Yes
2024/2025	1º	Applied Mathematics	Bachelor Degree in Digital Technologies and Information Security;	No
2023/2024	2º	Calculus	Bachelor Degree in Digital Technologies and Automation;	No
2023/2024	2º	Applied Mathematics Complements	Bachelor Degree in Digital Technologies and Information Security; Bachelor Degree in Digital Technologies and Health;	No
2023/2024	1º	Calculus	Bachelor Degree in Digital Technologies and Management;	No
2023/2024	1º	Graphs and Complex Networks	Bachelor Degree in Mathematics Applied and Digital Technologies;	No
2023/2024	1º	Mathematics	Bachelor Degree in Politics, Economics and Society;	No
2023/2024	1º	Applied Mathematics	Bachelor Degree in Digital Technologies and Information Security;	No
2022/2023	2º	Calculus		No
2022/2023	1º	Calculus	Bachelor Degree in Digital Technologies and Management;	No

Supervisions

• M.Sc. Dissertations

- Ongoing

	Student Name	Title/Topic	Language	Status	Institution
1	Cristina Maria Lima Pereira	Development of a Cultural Inclusion Module in AI for Nursing Without EHR Integration	--	Developing	Iscte

2	Raquel Maria Amado Guedes De Sá Azevedo	Ferramentas Digitais para a Gestão e Monitorização Pedagógica em Agrupamentos Escolares direcionados para as lideranças escolares	--	Developing	Iscte

• M.Sc. Final Projects

- Ongoing

	Student Name	Title/Topic	Language	Status	Institution
1	Maria do Carmo Cabrita Coelho	Mathematics at Each Student's Pace: Strategies for Pedagogical Differentiation with Digital Technologies in the 2nd Cycle	--	Developing	Iscte

Total Citations

Web of Science®	68
Scopus	58

Publications

• Scientific Journals

- Scientific journal paper

1	Oliva, R., Oliveira, A. P. & Barros, J. (2025). Modeling localized social vulnerability through probabilistic simulation: A case study in the Lisbon metropolitan area. International Journal of Disaster Risk Reduction. 129
2	Alexandra Brintrup, Barros, J. & Ashutosh Tiwari (2018). The Nested Structure of Emergent Supply Networks. IEEE Systems Journal. 12 (2), 1803-1812 - Times Cited Web of Science®: 11 - Times Cited Google Scholar: 26
3	Alexandra Brintrup, Anna Ledwoch & Barros, J. (2016). Topological robustness of the global automotive industry. Logistics Research. 9 (1) - Times Cited Web of Science®: 57 - Times Cited Scopus: 58 - Times Cited Google Scholar: 91

• Conferences/Workshops and Talks

- Publication in conference proceedings

1	João Guerreiro, Dias, J., Barros, J., Costa, P. & Laureano, M. (2025). On the Benefits of Teaching and Learning Symmetries Using AR and VR. In 2025 International Conference on Graphics and Interaction (ICGI). (pp. 1-8). Sintra, Portugal: IEEE.

• Other Publications

- Working Papers

1	Barros, J. & Turner, C. (N/A). Network Algorithm to Model Automotive Supply Chain Structure. Network Algorithm to Model Automotive Supply Chain Structure.

- Master's Dissertation

1	Barros, J. (2013). Synchronization phenomena with nonlinear oscillators.

- Doctoral Thesis

1	Barros, J. (2019). Structural Characteristics of Automotive Supply Networks.

Research Projects

Project Title	Role in Project	Partners	Period
The European University for Future Cities	Researcher	Iscte, Université Gustave Eiffel - Leader (France), AVANS - (Netherlands), LAUREA - (Finland), TH KOLN - (Germany), UHU - (Spain), IUAV - (Italy), UTB - (Czech Republic), UNIZA - (Slovakia), BFH - (Switzerland)	2025 - 2028

Academic Management Positions

Coordenador do 1º Ano (2025 - 2026)
Unit/Area: Bachelor Degree in Digital Technologies and Management

Coordenador do 2º Ano (2024 - 2025)
Unit/Area: Bachelor Degree in Digital Technologies and Management

Coordenador do 1º Ano (2023 - 2024)
Unit/Area: Bachelor Degree in Digital Technologies and Management