



TIAGO MOÇO FERREIRA

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Sex Male | Date of birth 17 June 1984 | Nationality Portuguese

POSITION

Consultant and Researcher in TRANSPORTATION SYSTEMS

PERSONAL STATEMENT

PhD with +10 years of experience in Transportation Systems & Infrastructures with main focus on design, modelling, simulation, predictive maintenance and resilience. Participation in international research, foresight, advisory & consultancy projects.

SKILLS

Problem solving | structured thinking | decision making | curiosity | adaptability
communication | collaboration | organization | concentration | resilience | motivation

EXPERIENCE

2018 – Present

Senior Consultant

ARUP – Design, Planning, Engineering and Consultancy (Madrid | London)
www.arup.com

Independent firm of designers, engineers, architects, planners, consultants and technical specialists working in the sectors of Transport, Cities, Energy and Water.

Consultant and project team leader in the fields of:

- Transport & Logistics (traffic management, planning, simulation and capacity analysis)
- Resilience to Climate Change (design, modelling, risk assessment, RAMS and LCC analysis)
- Predictive Asset Management (big data, machine learning and infrastructure digitalisation)

Performing as Arup's European Rail Digital Delegate in foresight advisory services.

TRANSPORT AND INFRASTRUCTURES

2016 – 2018

Consultant

SENER – Engineering and Technology Solutions (Madrid)
www.sener.es

Leading international company in the sectors of Infrastructures and Intelligent Transport Systems, Energy, Aerospace and Marine.

Consultant in projects of railway and transit systems (Commuters, High Speed, Hyperloop, Metro, Light Rail Transit, Airport APMs, railway Stations, etc.)

Risk & Safety analysis of railway infrastructures along with planning and simulation of operational capacity of railway systems for governmental authorities and public and private companies (financial entities, construction companies, concessionaries, etc.) as well as public and private companies.

International projects in EU, UK, EUA, Middle East, Latin America and Africa.

TRANSPORT AND OPERATIONS

2014 – 2016 Post-Doc Researcher

IST – University of Lisbon

CAPACITY4RAIL (European R&D project – Budget: 15.000.000€)

Increased capacity 4 Rail networks through enhanced infrastructure and optimised operations
www.capacity4rail.eu

C4R brings together the major stakeholders of industry, infrastructure managers, railway undertakers, engineering and academic sciences.

Definition of design requirements and guidelines to improve the resilience of railway infrastructures against climate change; simulation and modelling; Operations; LCC and RAMS analysis.

RAILWAY SYSTEMS**2010 – 2014 Researcher**

UPC – Polytechnic University of Catalonia

Development and programming of a constitutive model suitable to analyse the behaviour of transportation infrastructures due to traffic and environmental actions in FE program CODE_BRIGTH. The model is intended to assess the impact of extreme events caused by climate changes.

- Responsibilities: thermos-hydro-mechanical analysis; finite element programming, implementation and validation; simulation and modelling; publication of results.

CONSTITUTIVE MODELLING**2011 – 2014 Researcher**

IST – University of Lisbon

REFER – Portuguese Rail Infrastructure Manager

MODURAIL (National consultancy project)

Modelling Dynamic Uncertainty in Railway track life-cycle costs

Improvement and development of methodologies and software to assess the track deterioration, maintenance and cost prediction for the Portuguese rail infrastructure network.

- Responsibilities: Analysis and modelling of track degradation based on historical data in order to improve maintenance and renovation planning; big data mining; cluster analysis; uncertainty modelling of RAMS parameters; development of a decision support software application.

RAILWAY MAINTENANCE**2008 – 2011 Researcher**

IST – University of Lisbon

BITURAIL (National consultancy project)

Optimization of High-Speed Railway Track using Bituminous Subballast

Improvement of the design of high speed railway infrastructure through the incorporation of a bituminous layer (instead of granular) in order to increase its resilience against environmental actions.

- Responsibilities: structural design; finite element modelling and simulation; development of LCC analysis; reporting and publication of results.

INFRASTRUTURE DESIGN

EDUCATION

2008 – 2015 **PhD in Transportation Systems**

IST – University of Lisbon
MIT Portugal Program
Massachusetts Institute of Technology

“Design of railway track substructure modelling the long term thermo-hydro-mechanical behaviour due to traffic and environmental actions”

The research was developed in the field of transportation and geoenvironmental engineering:

- Analysis of coupled THM processes in railway infrastructures with simulation of the impact of extreme environmental events caused by climate change combined with long-term traffic actions.
- Formulation, finite element programming, implementation and validation of an elastic-viscoplastic constitutive model with isotropic and kinematic hardening suitable to model the cyclic behaviour and collapse of unsaturated soils due to environmental actions.

Jury Final Classification: **Pass with Merit**

2007 – 2009 **Advanced Studies Diploma in Transportation Systems**

IST – University of Lisbon

The specialization focused on three key domains: Engineering and Project Management; Financing and Contracts; and Policy and Institutions.

Main topics covered:

- Transport Policy and Institutions
- Business Models and Contracts
- Simulation Systems for Land-Use/Transport
- Research Methodologies in Social Sciences
- Risk and Decision Making
- Transport Demand Modelling
- Freight Transport and Logistics

Final Classification: **15/20**

2005 – 2007 **Integrated Master in Civil Engineering (5-years program)**

IST – University of Lisbon

Area of expertise: STRUCTURES

Some subjects covered:

- Bridges | Steel and Composite Structures
- Structural Dynamics & Earthquake engineering
- Regional and Urban Planning
- Fundamentals of Spatial Planning
- Management and Decision Analysis
- Operational Research
- Sustainable Development and Innovation

Final Classification: **16/20** | Master thesis: **18/20**

PERSONAL SKILLS

Mother tongue Portuguese

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
Spanish	C1	C1	C1	C1	C1
French	B1	B1	A1	A1	A2
Catalan	A1	A1	A1	A1	A2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
[Common European Framework of Reference for Languages](#)

Communication skills

Good communication skills gained through:

- Team building activities (strong interpersonal communication skills)
- Extensive experience in public presentations at international conferences and workshops
- Presentation and discussion of results in project meetings

Organisational / managerial skills

Good managerial skills gained through:

- Leadership of project teams (research and consulting)

Good organisational managerial skills gained as:

- Co-organizer of the International Seminar “BITURAIL – International Seminar on Optimization of Railway Design using bituminous subballast”, July 2011, Lisbon.
- Member of the organizational staff of the 12th World Conference on Transport Research, July 11-15 2010, Lisbon.

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient	Proficient	Proficient	Proficient	Proficient

Levels: Basic user - Independent user - Proficient user

- Expert user of software and applications for advanced finite element analysis, optimization problems and system dynamics modelling
- Experience in finite element programming, implementation and validation of advanced constitutive models and development of thermo-hydro-mechanical coupled analysis
- Advanced user of C++ and Fortran programming language
- Advanced user of MATLAB and Mathematica
- Advanced user Visual Basic Applications
- Advanced user of Windows and of the Microsoft OFFICE - Word, Excel, PowerPoint, Outlook, Access, Visio, Project and SharePoint
- Basic user of Web design and development software: CSS, HTML and WordPress CMS

ADDITIONAL INFORMATION

Publications in international SCI journals and conference proceedings

- Moço-Ferreira, T. and Teixeira, P. F. (2020) "Thermo-hydro-mechanical behaviour of the railway substructure during its initial years". Submitted to the "Journal of Pavement Engineering" in October 2019.
- Cardoso, R., Fernandes, V., Moço-Ferreira, T. and Teixeira, P. F. (2014) "Influence of atmospheric actions in the performance of railway embankments built with different subgrade soils. Proceedings of 14th International Conference of the International Association for Computer Methods and Recent Advances in Geomechanics, September 22-25, Kyoto, Japan.
- Moço-Ferreira, T. and Teixeira, P. F. (2012) "Rail track performance with different subballast solutions: traffic and environmental effects on subgrade service life". Journal of Transportation Engineering, 138(12) 1541-1550.
- Cardoso, R., Fernandes, V., Moço-Ferreira, T. and Teixeira, P. F. (2012). "Settlement prediction of high-speed railway embankments considering the accumulation of wetting and drying cycles". Proceedings of 2nd European Conference on Unsaturated Soils: Research and Applications, June 20-22, Napoly, Italy.
- Moço-Ferreira, T., Teixeira, P. F. and Cardoso, R. (2011). "Impact of Bituminous Subballast on Railroad Track Deformation Considering Atmospheric Actions." Journal of Geotechnical and Geoenvironmental Engineering, 137(3), 288-292.
- Moço-Ferreira, T., Teixeira, P.F. (2011). "Impact of different drainage solutions in the behaviour of railway trackbed layers due to atmospheric actions". Proceedings of 9th International Congress on Railway Research, WCRR 2011, May 22-26, Lille, France.
- Moço-Ferreira, T., Teixeira, P.F. and Cardoso, R. (2009). "Effects of incorporating a bituminous subballast layer on the deformation of railway trackbeds", Proceedings of 8th International Conference on the Bearing Capacity of Roads, Railways and Airfields, Champaign, Illinois, USA.

Presentations international conferences, congresses and workshops

- Moço-Ferreira, T. and Teixeira, P. F. (2015). "Impact of different subballast solutions on the service life of the railway substructure" Congress on Numerical Methods in Engineering, CMN 2015, June 29 - July 2, Lisbon, Portugal.
- Moço-Ferreira, T. and Teixeira, P. F. (2012) "Impact of drainage design on the behaviour of transport infrastructures due to atmospheric actions". 4th Workshop of CODE_BRIGHT users, May 2012, Barcelona, Spain. (personal invitation)
- Fernandes, V., Cardoso, R., Moço-Ferreira, T. and Teixeira, P. F. (2011) "Efeito de ciclos de molhagem e secagem no comportamento de um solo siltoso usado na construção de um aterro ferroviário". XIII Congresso Nacional de Geotecnia/ VI Congresso Luso-Brasileiro de Geotecnia, April 17-20, Lisbon, Portugal.
- Moço-Ferreira, T., Teixeira, P. F. and Cardoso, R. (2010). "Influence of incorporating a bituminous subballast layer on the deformations of railway trackbed due to climate actions". XVI Pan-American Conference of Traffic and Transportation Engineering and Logistics PANAM 2010, July 15-18, Lisbon, Portugal.
- Moço-Ferreira, T., Teixeira, P.F., López-Pita, A., Ferreira, P. A. and Caetano, L. F. (2010). "Innovation on high-speed track structural design through the use of bituminous material and its impact on infrastructure life cycle costs", XVI Pan-American Conference of Traffic and Transportation Engineering and Logistics PANAM 2010, July 15-18, Lisbon, Portugal.
- Moço-Ferreira, T., Cardoso, R. and Teixeira, P. F. (2009). "Comparação de duas soluções para infra-estruturas ferroviárias considerando os deslocamentos verticais devidos às ações atmosféricas", Congreso de Métodos Numéricos en Ingeniería (METNUM), June 29 - July 2, Barcelona, Spain.

Training courses

- Training on High-Speed Systems: Level 2 (50 hours)
UIC - International Union of Railways
- Specialization course in High-Speed Rail (50 hours)
IST – Technical University of Lisbon
- Training course in Railway Engineering (60 hours)
IST – Technical University of Lisbon

Honours and awards

- Awarded with a doctoral scholarship by the Portuguese Foundation for Science & Technology (FCT).
- Nominated for the Best Paper from a Young Research at the World Congress of Railway Research (WCRR 2011)

Academic and extracurricular activities

- Co-supervisor of MSc thesis:

Serrano, C. M. (2012) *“Thermo-hydro-mechanical three-dimensional analysis for the study of the deformational behaviour of the railway subgrades due to atmospheric actions”*, Instituto Superior Técnico (IST) – University of Lisbon. (Jury Final Classification: 18/20)

(Mentor of several MSc thesis and research activities)

- Delegate of the Integrated Master Degree (MSc) in Civil Engineering at Instituto Superior Técnico
- Federated football player for 15 years (team captain in different age categories)