Curriculum Vitae

Personal Information

Name	Tarrataca, Luís
Nationality	Portuguese
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Summary

I received my B.Sc. (2007), M.Sc (2008) and Ph.D (2013) degrees from Instituto Superior Técnico / Technical University of Lisbon in Portugal. My master thesis was performed under the supervision of Professor João Cardoso (FEUP, Portugal) and encompassed embedded systems and computer vision. My doctorate was obtained under the supervision of Professor Andreas Wichert (IST, Portugal) and presented artificial intelligence mappings for quantum computation. Currently, I am a professor at the Department of Computer Engineering in CEFET-RJ and also a researcher at LNCC's Quantum Computing Group group in Rio de Janeiro, Brazil. My main research focus consists on developing techniques for solving practical problems using machine learning techniques. I have also contributed to the field of signal processing by coauthoring research on adaptive filtering, tracking, and exact expectation on the least mean squares algorithm. Recently, I have also developed an interest in computational analysis techniques and mathematical modelling of infectious diseases using artificial intelligence.

Teaching Experience

2016 -	Professor at CEFET-RJ, Brazil
2010 - 2011	"Operating Systems" teaching assistant at Instituto Superior Tecnico (Portugal)

Graduation Courses Lectured

2016 - 2021	Computer Architecture
2016 - 2021	Advanced Algorithmic Analysis
2017 - 2021	Operating Systems
2019 - 2021	Linear Programming
2020 - 2021	Introduction to Computational Science
2020 - 2021	Object Oriented Programming

Research Experience

2016 -	Researcher at CEFET-RJ
2014 - 2016	Researcher at LNCC's Quantum Computing Group
2010 - 2013	Research Assistant at Intelligent Agents and Synthetic Characters - GAIPS/INESC-ID.
2008 - 2010	Research Assistant at Data Management and Information Retrieval - DMIR/INESC-ID.
2007 - 2008	Research Assistant at Analysis and Compilation Tools for Reconfigurable Architectures - ANCORA/INESC-ID.

Academic Experience

2014	Postdoctoral Fellow at LNCC's Quantum Computing Group
2013	Doctorate (PhD) in Information Systems and Computer Engineering at Instituto Superior Tecnico - Technical University of Lisbon/INESC-ID, Portugal.
2010	Advanced Specialization Diploma in Information Systems and Computer Engineering at Instituto Superior Tecnico - Technical University of Lisbon/INESC-ID, Portugal.
2008	Master (MSc) in Information Systems and Computer Engineering at Instituto Superior Tecnico - Technical University of Lisbon/INESC-ID, Portugal.
2007	Bachelor (BSc) in Information Systems and Computer Engineering at Instituto Superior Tecnico - Technical University of Lisbon, Portugal.

Scientific Research Grants Obtained

2016	ARC 2016 FAPERJ, Brazil

Scientific Initiation Orientation Experience

2022	Luiz Eduardo Seabra da Costa - COVID-19 Epidemiological Modelling
2019	Gabriela Guedes - Emotion recognition system
2019	Rayssa Rosa - Reinforcement learning techniques
2019	Sarah Lisboa - Discrete Geometric Problem
2018	Gabriela Guedes - Lip recognition system

Final Year Projects Orientation Experience

2024	Luiz Eduardo Seabra da Costa - COVID-19 Epidemiological Modelling
2023	Thalis Duarte Galeno, GreedyKS
2023	Vinícius de Paula Silvestre, Epidemiological simulation using reinforcement learning
2023	Guilherme Guimarães Vieira Lourenço da Silva, Exploratory analysis of the legislative power in the Federative Republic of Brazil
2023	Alexandre Clem Belchior dos Santos, Roger de Souza Passos, Credit card fraud detection using synthetic data
2021	Lukas Torquato and Lucas Santos, Deep Reinforcement Learning Financial Bot
2020	Gabriela Guedes - Emotion recognition system
2020	Rayssa Rosa - Reinforcement learning techniques for the financial marked
2020	Matheus Albuquerque - Geolocation system
2020	Sarah Lisboa - Geolocation system
2019	Gabrielle Brito - Portuguese text production through recurrent neural networks

Master Thesis Orientation Experience

2019 - 2020	Gustavo Alexandre Sousa Santos, EvolveDTree, CEFET-RJ, Brazil
2021 - 2022	Marcelo L. Moreira, COVID-19 AI SEIR, CEFET-RJ, Brazil

Scientific Publications

Artificial Intel.	Viana, D.P.; de Sá Só Martins, D.H.C.; de Lima, A.A.; Silva, F.; Pinto, M.F.; Gutiérrez, R.H.R.; Monteiro, U.A.; Vaz, L.A.; Prego, T.; Andrade, F.A.A.; Tarrataca, L.; Haddad, D.B. "Diesel Engine Fault Prediction Using Artificial Intelligence Regression Methods. Machines", 2023, 11, 530.
	Yngwi Guimarães, Luis Tarrataca, Douglas Cardoso, Laura S. de Assis "Sentiment Analysis Applied to IBOVESPA Prediction. Optimization", OL2A 2022 2022)
	Dionisio H. C. S. S. Martins, Amaro A. de Lima, Milena F. Pinto, Douglas de O. Hemerly, Thiago de M. Prego, Fabricio L. e Silva, Luis Tarrataca, Ulisses A. Monteiro, Ricardo H. R. Gutierrez & Diego B. Haddad "Hybrid data augmentation method for combined failure recognition in rotating machines", Journal of Intelligent Manufacturing 2022
	Luis Tarrataca, Claudia Mazza Dias, Diego Barreto Haddad, Edilson Fernandes De Arruda "Flattening the curves: on-off lock-down strategies for COVID-19 with an application to Brazil", Journal of Mathematics In Industry, 11, Springer, 2021

	Dionísio Henrique Carvalho de Sá Só Martins, Denys Pestana Viana, Amaro Azevedo de Lima, Milena Faria Pinto, Luís Tarrataca, Fabrício Lopes e Silva, Ricardo Homero Ramírez Gutírrez, Thiago de Moura Prego, Ulisses Admar Barbosa Vicente Monteiro and Diego Barreto Haddad "Diagnostic and severity analysis of combined failures composed by imbalance and misalignment in rotating machines", The International Journal of Advanced Manufacturing Technology volume 114, pages 3077 - 3092, 2021
	Diego B. Haddad, Laura S. Assis, Luis Tarrataca, Andrea S. Gomes, Marcos B. Ceddia, Rosane F. Oliveira, Jurair. R. de P. Junior and Diego N. Brandao "Brazilian Soil Bulk Density Prediction Based on a Committe of Neural Regressors", IJCNN 2018
Genetic Algorithms	Epifanio G., González, J. Usberti, F. Tarrataca, L., Assis, L. "Switch Allocation Problem in Power Distribution Systems with Distributed Generation.", Operations Research Forum 2023
	Albuquerque, D., Tarrataca, L., Brandão, D., & Coutinho, R. "A Genetic Algorithm with Flexible Fitness Function for Feature Selection in Educational Data: Comparative Evaluation.", Journal of Information and Data Management 2022
	Jorge A. G. de Brito, Diego R. M. Totte, Fabio O. Silva, Jurair R. de P. Junior, Felipe da Rocha Henriques1, LuIs Tarrataca, Diego Barreto Haddad, Laura S. de Assis "Memetic algorithm applied to topology control optimization of a wireless sensor network", Wireless Networks 2022
	Laura S. de Assis, Jurair R. de P. Junior, Luis Tarrataca, Diego B. Haddad "Efficient Volterra Systems Identification Using Hierarchical Genetic Algorithms" Applied Soft Computing, v. 85, p. 105745, 2019.
Signal Processing	Igreja, F., Lara, P., Tarrataca, L. et al. "Analyzing the LMS Weight Error Covariance Matrix: An Exact Expectation Approach." Circuits Syst Signal Process 2024.
	J. V. G. De Souza, F. d. R. Henriques, N. N. Siqueira, L. Tarrataca, F. A. A. Andrade and D. B. Haddad, "Stochastic Modelling of the Set-Membership-sign-NLMS Algorithm" in IEEE Access, doi: 10.1109/ACCESS.2024.3370439, 2024.
	Silva, Thiago T. P.; Igreja, Filipe; Lara, Pedro; Tarrataca, Luís; Kar, Asutosh; Haddad, Diego B. . On the Skewness of the LMS Adaptive Weights. IEEE Transactions on Circuits and Systems II - Express Briefs, v. 1, p. 1-1, 2021.
	Do Prado, Robson A.; Guedes, Raphael M; Henriques, Felipe da R.; Da Costa, Felipe M.; Tarrataca Luís D.T.J.; Haddad, Diego B. "On the Analysis of the Incremental ell_0-LMS Algorithm for Distributed Systems." Circuits Systems and Signal Processing, 2020
	Carmo, Rafael M.; Tarrataca, Luís; Colares, Jefferson; Henriques, Felipe R.; Haddad, Diego B; Guedes, Raphael M. "Distributed Adaptive Filtering on Wireless Sensor Networks with Shared Medium Competition." Learning and Nonlinear models, v. 18, p. 15-34, 2020.
	Lara, Pedro ; Haddad, Diego ; Tarrataca, Luis ; Teodoro, Thiago ; Igreja, Filipe . "Exact Expectation Analysis of the LMS Adaptive Identification of Nonlinear Systems." Electronics Letters, v. 56, p. 45-48, 2019.

Lara, Pedro ; Haddad, Diego B. ; Tarrataca, Luis. "Advances on the analysis of the LMS algorithm with a colored measurement noise". Signal Image and Video Processing, v. 1, p. 1-8, 2019.

Rafael Moura do Carmo, Luis Tarrataca, Jefferson Colares, Felipe da R. Henriques, Diego B. Haddad, Raphael M. Guedes "Distributed Adaptive Filtering on Wireless Sensor Networks with Shared Medium Competition", Learning and Nonlinear Models, 2019

Pedro Lara, Luis Tarrataca, Diego Haddad "Exact Expectation Analysis of the Deficient-Length LMS Algorithm", Signal Processing, Volume 162, September 2019, Pages 54-64

Pedro Lara, Filipe Igreja, Luis Tarrataca, Diego Haddad, Mariane Petraglia "Exact Expectation Evaluation and Design of Variable Step-Size Adaptive Algorithms", IEEE Signal Processing Letters, October 2018, 10.1109/LSP.2018.2880084

Quantum Comput.

T. G. Wong, L. Tarrataca, and N. Nahimov, Laplacian versus Adjacency Matrix in Quantum Walk Search, Quantum Information Processing, 2016, arXiv:1512.05554

Pascal Philipp, Luis Tarrataca, Stefan Boettcher, Continuous-Time Quantum Search on Balanced Trees, Physical Review A, 93, 2016, 10.1103/PhysRevA.93.032305

Pascal Philipp, Luis Tarrataca, Stefan Boettcher. Continuous-Time Quantum Search on Balanced Trees, arXiv:1601.01154

Thomas G. Wong, Luis Tarrataca, Nikolay Nahmov Laplacian versus Adjacency Matrix in Quantum Walk Search, arXiv:1512.05554

Luís Tarrataca. Challenges of adiabatic quantum evaluation of NAND trees, Quantum Information Processing, 10.1007/s11128-015-1137-3

Luis Tarrataca. Quantum Adiabatic Evaluation of Trees. Poster presentation, TQC 2015, Brussels, Belgium.

Luis Tarrataca and Andreas Wichert. Quantum iterative deepening with an application to the halting problem. PLOS One, 2013.

Luis Tarrataca and Andreas Wichert. Intricacies of quantum computational paths. Quantum Information Processing, 12:13651378, 2013. 10.1007/s11128-012-0475-7.

Luis Tarrataca and Andreas Wichert. A quantum production model. Quantum Information Processing, 11(1):189209, 2012. 10.1007/s11128-011-0231-4.

Luis Tarrataca and Andreas Wichert. Iterative quantum tree search. CiE 2012 - How the World Computes, 2012.

Luis Tarrataca and Andreas Wichert. Can quantum entanglement detection schemes improve search? Quantum Information Processing, 11(1):5566, 2012. 10.1007/s11128-011-0231-4.

Luis Tarrataca and Andreas Wichert. Tree search and quantum computation. Quantum Information Processing, 10(4):475500, 2011. 10.1007/s11128-010-0212-z.

Computer Vision	Luis Tarrataca and Andreas Wichert. Problem-solving and quantum computation. Cognitive Computation, 3:510524, 2011. 10.1007/s12559-011-9103-6.
	Luis Tarrataca and Andreas Wichert. A hierarchical sorting oracle. In Massimo Melucci, Dawei Song, and Ingo Frommholz, editors, Proceedings of the Fifth International Quantum Interaction Symposium, 2011. 10.1007/978-3-642-24971-6_17
	Andre Santos, Luis Tarrataca, and Joao Cardoso. The feasibility of navigation algorithms on smartphones using j2me. Mobile Networks and Applications, 15:819830, 2010. 10.1007/s11036-010-0236-8.
	Andre Coelho Santos, Luis Tarrataca, and Cardoso Joao. An analysis of navigation algorithms for smartphones using j2me. In Proceedings of the Second International ICST Conference on MOBILe Wireless MiddleWARE, Operating Systems, and Applications (MobilwareÕ09, Berlin-Germany, April 28-29), LNICST, volume 7, pages 266279. Springer, 2009.
	Luis Tarrataca, Andre Coelho Santos, and Cardoso Joao. The current feasibility of gesture recognition for a smartphone using j2me. In Proceedings of the 2009 ACM Symposium on Applied Computing (Honolulu, Hawaii). SAC09., pages 16421649, New York, NY, 2008. ACM.
Middleware Dev.	Andre Coelho Santos, Luis Tarrataca, and Cardoso Joao. Context inference for mobile applications in the upcase project. In Proceedings of the Second International ICST Conference on MOBILe Wireless MiddleWARE, Operating Systems, and Applications (MobilwareÕ09, Berlin-Germany, April 28-29), LNICST, volume 7, pages 352365. Springer, 2009. 10.1007/978-3-642-01802-2_26

Technological Skills/Expertise

Program. Languages	C/C++, JAVA, Python, JavaScript, LISP/Scheme, C#, Perl
Comput. Software	Mathematica, Matlab, R, Octave, Lucene
Parallel Computing	CUDA, OpenCL, MPI
Operating Systems	Linux, MacOS, Android

Honors & Awards

Postdoc Grant	CNPq BJT CSF grant reference 301181/2014-4 (Brazil)
PhD Grant	FCT grant reference DFRH - SFRH/BD/61846/2009 (Portugal)
PhD Award	Best PhD 2013, INESC-ID research laboratory (Portugal)

Projects

UPCASE | The UPCASE project was a joint effort between between ANCORA and PT Inovacao that made use of sensors available in mobile devices as well as sensors externally connected via Bluetooth. This data was employed in order to perform feature extraction and context inference in order to learn and identify contexts automatically and dynamically at runtime.

ABLIP | Co-founder of ABLIP Innovation a startup research company focusing on integrating information retrieval methods alongside knowledge management platforms and mobile devices. The first product released was Blob Squad, a casual Android game for testing reaction speed, logic, and skill.

Language Skills

English | Fluent User in Oral/Reading Comprehension
Fluent User in Oral/Production Conversation
Fluent User in Writing

Portuguese | Native User in Oral/Reading Comprehension
Native User in Oral/Production Conversation
Native User in Writing

French | Basic User in Oral/Reading Comprehension
Basic User in Oral/Production Conversation
Basic User in Writing

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