

Curriculum Vitae

Personal Information

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Summary

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 Petrópolis, Rio de Janeiro. I am interested in the possibilities brought upon by quantum computation. My main research focus considers how to use the quantum adiabatic setting employed by quantum annealers in order to develop practical optimization algorithms. My research also explores questions surrounding the power of quantum computation, quantum walks, quantum graph search, quantum complexity. I am also interested in questions regarding how to map Artificial Intelligence concepts into a quantum context, from performing classical tree search, applying heuristics, graph transversal techniques and alternative search methods based on space decomposition. 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.

Teaching Experience

2016 -	Professor at CEFET-RJ
2010 - 2011	“Operating Systems” teaching assistant at Instituto Superior Técnico (Portugal)

Courses Taught

2016 - 2020	Computer Architecture
2016 -	Advanced Algorithmic Analysis
2017 -	Operating Systems
2019 -	Linear Programming
2020 -	Introduction to Computational Science
2020 -	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 Initiation Orientation Experience

2018	Gabi Guedes - Lip recognition system
2019	Gabi Guedes - Emotion recognition system
2019	Rayssa Rosa - Reinforcement learning techniques

Final Year Projects Orientation Experience

2020	Gabriela Guedes - Emotion recognition system
2020	Rayssa Rosa - Reinforcement learning techniques for the financial market
2020	Matheus Albuquerque - Geolocation system
2020	Gabrielle Brito - Portuguese text production through recurrent neural networks

Master Thesis Orientation Experience

2019 - 2020 | Gustavo Alexandre Sousa Santos, EvolveDTree, CEFET-RJ

Scientific Publications

Signal Processing	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
	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.
	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, 12:1365–1378, 2013. 10.1007/s11128-012-0475-7.

	Luis Tarrataca and Andreas Wichert. A quantum production model. <i>Quantum Information Processing</i> , 11(1):189–209, 2012. 10.1007/s11128-011-0231-4.
	Luis Tarrataca and Andreas Wichert. Iterative quantum tree search. <i>CiE 2012 - How the World Computes</i> , 2012.
	Luis Tarrataca and Andreas Wichert. Can quantum entanglement detection schemes improve search? <i>Quantum Information Processing</i> , 11(1):55–66, 2012. 10.1007/s11128-011-0231-4.
	Luis Tarrataca and Andreas Wichert. Tree search and quantum computation. <i>Quantum Information Processing</i> , 10(4):475–500, 2011. 10.1007/s11128-010-0212-z.
	Luis Tarrataca and Andreas Wichert. Problem-solving and quantum computation. <i>Cognitive Computation</i> , 3:510–524, 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, <i>Proceedings of the Fifth International Quantum Interaction Symposium</i> , 2011. 10.1007/978-3-642-24971-6_17
Computer Vision	Andre Santos, Luis Tarrataca, and Joao Cardoso. The feasibility of navigation algorithms on smartphones using j2me. <i>Mobile Networks and Applications</i> , 15:819–830, 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 <i>Proceedings of the Second International ICST Conference on MOBILE Wireless MiddleWARE, Operating Systems, and Applications (Mobilware'09, Berlin-Germany, April 28-29)</i> , LNICST, volume 7, pages 266–279. Springer, 2009.
	Luis Tarrataca, Andre Coelho Santos, and Cardoso Joao. The current feasibility of gesture recognition for a smartphone using j2me. In <i>Proceedings of the 2009 ACM Symposium on Applied Computing (Honolulu, Hawaii)</i> . SAC '09., pages 1642–1649, 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 <i>Proceedings of the Second International ICST Conference on MOBILE Wireless MiddleWARE, Operating Systems, and Applications (Mobilware'09, Berlin-Germany, April 28-29)</i> , LNICST, volume 7, pages 352–365. 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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