

CURRICULUM VITAE

Carlos Miguel da Costa Fernandes



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Current Position: Post-doctoral research fellow at the Technical University of Lisbon with permanent collaboration with the University of Granada

Education

Graduation Degree in Electrotechnics and Computer Engineering, Technical University of Lisbon, Instituto Superior Técnico (IST), 1998.

Master in Electrotechnics and Computer Engineering (theme: Genetic Algorithms), Technical University of Lisbon, IST, 2002.

Ph.D in Sciences of Engineering (theme: Genetic Algorithms), Technical University of Lisbon, IST, 2009.

PhD Thesis

Title: *Diversity-enhanced Genetic Algorithms for Dynamic Optimization*

The work was carried out at Instituto de Sistemas e Robótica (IST) under the supervision of Prof. Agostinho Rosa.

Abstract: Many industrial applications have dynamic components that lead to variations of the fitness function and Genetic Algorithms (GAs) adaptiveness is a suitable tool to solve this type of problems. The thesis proposes two new evolutionary methods to tackle dynamic problems. The first proposal acts upon mating and avoids crossover

between similar individuals, via a self-regulated mechanism, thus preserving genetic diversity. The second is a new mutation operator that is able to evolve self-regulated mutation rates with a particular distribution that is suited for dynamic optimization. Finally, a very efficient hybrid method that combines both strategies is proposed. The main claim is that it is possible to design nature-inspired protocols for traditional GAs that are efficient when evolving on dynamic environments while not increasing GAs complexity or requiring information about the problem. The proposals were tested on a wide range of problems and were able to frequently outperform other GAs, namely when the changes are not very fast. The hybrid scheme proved to be particularly effective since it broadened the range of dynamics in which each method by itself excels. As projected, the proposed techniques are robust and do not increase GAs parameter space, thus opening the doors to real-world applications.

Specialization Domains

Evolutionary Computation, Swarm Intelligence and Complexity. Generative Art.

Other Research Interests

Dynamic Optimization. Artificial Life. Neural Networks. Self-Organization. Self-Organized Criticality. Medical Imaging. Automatic Sleep Stages Classification. Artificial and Evolutionary Art. Interactions between Art and Science.

Academic and Research Experience

Invited teacher: master and PhD program on Computational Intelligence, ISCTE-IUL, Lisbon, since 2010.

Post-doctoral research scholarship, granted by FCT, Portuguese Ministry of Science, since 2010

Research Fellow at Geneura, E.T.S. Ingeniería Informática, University of Granada, since November 2007.

Research Fellow at Laseeb (Evolutionary Systems and Biomedical Engineering Laboratory), Instituto Superior Técnico, Technical University of Lisbon, since 1998.

Assistant Teacher, Systems and Informatics Department, School of Technology, Polytechnic Institute of Setubal (2001-2005).

Scientific Projects

AGHora - Dynamic Timetabling by Genetic Algorithms 98-00 (Praxis XXI, S&T Portuguese Foundation)

DCT - Multimedia Products for Science and Technology Divulgence 98-00 (Praxis XXI, S&T Portuguese Foundation)

Arquitectura de Altas Prestaciones para Algoritmos Bioinspirados Aplicados a la Biología de Sistemas. Awarded by Junta de Andalucía, Spain, 2009.

Project EvOrq (TIC-3903). Awarded by the Andalusian Regional Government.

Project CANUBE (CEI2013-P-14). Awarded by the Spanish Ministry of Science and Innovation.

Project ANYSELF (TIN2011-28627-C04-02). Awarded by the Spanish Ministry of Science and Innovation.

Awards

Winner of the *Evolutionary Art, Design and Creativity Competition* of Genetic and Evolutionary Computation Congress (GECCO) 2012, Philadelphia, USA, July 2012, with the swarm art project “Abstracting the Abstract”.

Best Paper Award of the 4th International Conference on Evolutionary Computation Theory and Practice, Barcelona, Spain, October 2012, with the paper “Using Self-Organized Criticality for Adjusting the Parameters of a Particle Swarm”.

Publications

(Theses)

1. C.M. Fernandes, Diversity-Enhanced Genetic Algorithms for Dynamic Optimization, Doctoral Thesis, Technical University of Lisbon, 2009.
2. C.M. Fernandes, Algoritmos Genéticos e Acasalamento não-aleatório (Genetic Algorithms and Non-Random Mating), Msc. Thesis, Technical University of Lisbon, Lisbon, 2002 (in Portuguese).
3. C.M. Fernandes, Geração Automática de Horários por Algoritmos Genéticos (Automatic School Timetables with Genetic Algorithms), Engineering Degree Thesis, Technical University of Lisbon, Lisbon, 1998 (in Portuguese).

Publications

(Journals)

1. **C.M. Fernandes**, A.M. Mora, J.J. Merelo, A.C.Rosa, KANTS: A Stigmergic Ant Algorithm for Cluster Analysis and Swarm Art, *IEEE Transactions on Systems, Man and Cybernetics*, accepted, 2013
2. L.J. Herrera, A.M. Mora, A. Guillen, D. Migotina, R. Largo, A.C. Rosa, **C.M. Fernandes**, Combination of Feature Extraction Methods from EEG and Context Information for Sleep Stage Classification, *International Journal of Neural Systems*, accepted, 2013.
3. **C.M. Fernandes**, Pherographia and other Hidden Landscapes, *International Journal of Arts and Technology*, accepted, 2013.
4. **C.M. Fernandes**, J.L.J. Laredo, J.J. Merelo, A.C. Rosa, The Sandpile Mutation Genetic Algorithm: an Investigation on the Working Mechanisms of a Diversity-Oriented and Self-Organized Mutation Operator for Non-stationary Functions, *Applied Intelligence* (IF = 0.85), online, February 2013.

5. J.J. Merelo, A.M. Mora, **C.M. Fernandes**, A.I. Esparcia-Alcázar, Designing and Testing a Pool-based Evolutionary Algorithm, *Natural Computing*, online September 2012, DOI: 10.1007/s11047-012-9338-5
6. Fernández-Ares, A.M. Mora, J.J. Merelo, P. García-Sánchez, **C.M. Fernandes**, Effect of Noisy Fitness in Real-Time Strategy Games Player Behaviour Optimisation Using Evolutionary Algorithms, *Journal of Computer Science and Technology* (IF = 0.656), Vol. 27(5), pp. 1007-1023, 2012.
7. **C.M. Fernandes**, J.J. Merelo, A.C.Rosa, A Comparative Study on the Performance of Dissortative Mating and Immigrants' Strategies for Evolutionary Dynamic Optimization, *Information Sciences* (IF = 2.833), Vol. 181(20), pp. 4428-4459, 2011.
8. **C.M. Fernandes**, Pherographia: Drawing by Ants, *Leonardo* 43(2), pp. 107-112, April 2010.
9. J.L.J. Laredo, P.A. Castillo, A.M. Mora, **C.M. Fernandes**, J.J. Merelo, Resilience to Churn of a Peer-to-Peer Evolutionary Algorithm, *International Journal of High Performance Systems Architecture*, Vol. 1(4), pp. 260-268, 2009.
10. **C.M. Fernandes**, A Camera Obscura for Ants, *Newsletter of ACM Special Interest Group on Genetic and Evolutionary Computation: SIGEvolution*, Vol. 3 (2), pp. 9-16, 2008.
11. **C.M. Fernandes**, A.C. Rosa, Self-Adjusting the Intensity of Assortative Mating in Genetic Algorithms. *Journal of Soft Computing*, Vol. 12(10), pp. 955-979, 2008 (IF = 1.880).
12. **C.M. Fernandes**, V. Ramos and A.C. Rosa, Self-Regulated Artificial Ant Colonies on Digital Image Habitats, *International Journal of Lateral Computing* 2 (1), pp. 1-8, ISSN 0973-208X, 2005.

Publications

(Book Chapters)

1. **C.M. Fernandes**, J.J. Merelo, A.C.Rosa, A Time-Varying Inertia Weight Strategy for Particles Swarms Based on Self-Organized Criticality, *Studies in Computational Intelligence (IJCCI 2012 revised selected papers)*, Springer-Verlag, to appear, 2013.
2. **C.M. Fernandes**, A.M. Mora, J.J. Merelo, A.C.Rosa, Photorealistic rendering with an Ant Algorithm, *Studies in Computational Intelligence (IJCCI 2012 revised selected papers)*, Springer-Verlag, to appear, 2013.
3. **C.M. Fernandes**, J.J. Merelo, A.C.Rosa, Enhancing the Adaptive Dissortative Mating Genetic Algorithm in Fast Non-stationary Fitness Functions, *Studies in Computational Intelligence series (IJCCI 2010 revised Selected Papers)*, Springer-Verlag, pp.115-130, 2012.
4. A.M. Mora, **C.M. Fernandes**, J.J. Merelo, KANTS: A Self-Organized Ant System for Pattern Clustering and Classification, in *Ant Colonies: Behavior in Insects and Computer Applications*, Nova Publishers, pp. 195-211, 2011

5. **C.M. Fernandes**, A.C. Rosa, Genetic Algorithms with Assortative Mating in Static and Dynamic Environments, In W Kosinski (Ed.), *Advances in Evolutionary Computation*, ARC publishers, 181-206, 2008.

Publications

(refereed Conference Proceedings)

2013

1. **C.M. Fernandes**, J.L.J. Laredo, J.J. Merelo, C. Cotta, A.C. Rosa, Adapting the Bak-Sneppen Model to a Dynamic and Partially Connected Grid of Hierarchical Species, ECAL 2013, to appear.
2. **C.M. Fernandes**, A.M. Mora, J.J. Merelo, A.C. Rosa, Foto-renderización com Inteligencia de Enjambre, MAEB 2013, to appear.
3. P. García Sánchez, M. García-Arenas, A. M. Mora, P. Castillo, **C.M. Fernandes**, J. G. Peñalver, G. R. López, J.J. Merelo, P. de Las Cuevas, Desarrollo de servicios para una Arquitectura Orientada a Servicios para Algoritmos Evolutivos, MAEB 2013, to appear.
4. **C.M. Fernandes**, J.L.J. Laredo, J.J. Merelo, C. Cotta, A.C. Rosa, A Study on Time-Varying Partially Connected Topologies for Particle Swarms, CEC 2013, to appear.
5. **C.M. Fernandes**, A.M. Mora, J.J. Merelo, C. Cotta, A.C. Rosa, Photo rendering with Swarms, 2013 IEEE Symposium on Computational Intelligence, 2013, to appear.
6. **C.M. Fernandes**, J.L.J. Laredo, J.J. Merelo, C. Cotta, A.C. Rosa, Partially Connected Topologies for Particle Swarms, GECCO 2013, to appear.
7. J.M.S. Pascualvaca, **C.M. Fernandes**, A. Guillen, A.M. Mora, R. Largo, A.C. Rosa L.J. Herrera, Sleep Stage Classification Using Advanced Intelligent Methods, IWANN 2013, to appear.
8. J.L.J. Laredo, B. Dorronsoro, **C.M. Fernandes**, J.J. Merelo, P. Bouvry, Oversized Populations and Cooperative Selection: Dealing with Massive Resources in Parallel Infrastructures, LION 7, 2013. (http://lion.disi.unitn.it/intelligent-optimization/LION7/Laredo-Dorronsoro-Fernandes-Merelo-Bouvry_paper85.pdf)

2012

9. J.L.J. Laredo, B. Dorronsoro, J. Pecero, P. Bouvry, J.J. Durillo, **C.M. Fernandes**, Designing a Self-Organized Approach for Scheduling Bags-of-Tasks, *Proc. of the 2012 Seventh International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC)*, pp. 315 – 320, 2012.
10. J.J. Merelo, A.M. Mora, **C.M. Fernandes**, A. Esparcia, J.L.J. Laredo, Pool vs. island based evolutionary algorithms: an initial exploration, *Proc. of the 2012 Seventh International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC)*, pp. 19-24, 2012.
11. **C.M. Fernandes**, J.J. Merelo, A.C. Rosa, Using Self-Organized Criticality for Adjusting the Parameters of a Particle Swarm Optimization Algorithm, *Proc. of the*

- 4th *International Conference on Evolutionary Computation Theory and Applications*, pp. 62-71, 2012. ([Best Paper Award](#)).
12. **C.M. Fernandes**, J.J. Merelo, A.C. Rosa, Pherogenic Drawings: Generating 2-dimensional Abstract Representations of Sleep EEG with the KANTS Algorithm, *Proc. of the 4th International Conference on Evolutionary Computation Theory and Applications*, pp. 72-80, 2012.
 13. **C.M. Fernandes**, J.J. Merelo, A.C. Rosa, Swarm Art with KANTS: 2-Dimensional Representations of Sleep EEG with an Ant-based Algorithm, *Proc. of the 2012 International Conference on Complex Systems (ICCS)*, pp. 1-6, 2012. DOI: [10.1109/ICoCS.2012.6458508](https://doi.org/10.1109/ICoCS.2012.6458508)
 14. **C.M. Fernandes**, J.L.J. Laredo, J.J. Merelo, C. Cotta, A.C. Rosa, Towards a 2-dimensional self-organized framework for structured population-based metaheuristics, *Proc. of the 2012 International Conference on Complex Systems (ICCS)*, pp. 1-6, 2012. DOI: [10.1109/ICoCS.2012.6458516](https://doi.org/10.1109/ICoCS.2012.6458516)
 15. **C.M. Fernandes**, J.J. Merelo, A.C. Rosa, Controlling the Parameters of the Particle Swarm Optimization with Self-Organized Criticality, *Proc. of the 12th Parallel Problem Solving from Nature - PPSN XII*, LNCS 7492, pp 153-163, 2012.
 16. **C.M. Fernandes**, J.J. Merelo, F. Fernández, A.C. Rosa, Particle Swarm with Self-Organized Criticality, *Proceedings of the 14th International Conference on Genetic and Evolutionary Computation Conference (GECCO 2012)*, ACM, pp. 1397-1398, 2012
 17. J.J. Merelo, A.M. Mora, **C. M. Fernandes**, Anna I. Esparcia-Alcázar, Validating design choices in a pool-based distributed evolutionary algorithms architecture, *Proceedings of the 14th International Conference on Genetic and Evolutionary Computation Conference (GECCO 2012)*, ACM , Pages 1517-1518, 2012
 18. J.J. Merelo, A.M. Mora, **C. M. Fernandes**, Anna I. Esparcia-Alcázar, SofEA, a distributed, asynchronous, pool-based based on couch DB, *Proceedings of the 14th International Conference on Genetic and Evolutionary Computation Conference (GECCO 2012)*, ACM, pp. 109-116, 2012 (preprint).
 19. **C.M. Fernandes**, J.J. Merelo, F. Fernández, A.C.Rosa, Generating Colored 2-Dimensional Representations of Sleep EEG with the KANTS Clustering Algorithm, *Proceedings of the 14th International Conference on Genetic and Evolutionary Computation Conference (GECCO 2012)*, ACM, pp. 435-442, 2012 (preprint).
 20. A. Fernández-Ares, A.M. Mora, P. García-Sánchez, J.J. Merelo, **C.M. Fernandes**, Optimización Evolutiva de Bots Para el Juego Planet Wars, in *Proceedings of the VIII Congreso Español sobre Metaheurísticas, Algoritmos Evolutivos y Bioinspirados (MAEB)*, 2012.
 21. **C.M. Fernandes**, J.L.J. Laredo, A.C.Rosa, J.J. Merelo, Estudio de un Operador de Mutación para Algoritmos Genéticos Basado en la Teoría de la Criticalidad Auto-Organizada, in *Proceedings of the VIII Congreso Español sobre Metaheurísticas, Algoritmos Evolutivos y Bioinspirados (MAEB)*, 2012.

2011

22. L.J. Herrera, A.M. Mora, D. Migotina, A.C. Rosa, **C.M. Fernandes**, Symbolic Representation of EEG for Sleep Stage Classification, in *Proceedings of 11th International Conference on Intelligent Systems Design and Applications (ISDA)*, pp. 253 - 258 , 2011
23. **C.M. Fernandes**, C. Isidoro, F. Barata, A.C. Rosa, J.J. Merelo, From Pherographia to Color Pherographia: Color Sketching with Artificial Ants, *Proceedings of the 2011 Congress on Evolutionary Computation*, pp. 1124 – 1131, 2011
24. A. Fernandez-Ares, A. Mora, J.J. Merelo, P.G. Sánchez, **C.M. Fernandes**, Optimizing player behavior in a real-time strategy game using evolutionary algorithms, *Proceedings of the 2011 Congress on Evolutionary Computation*, pp. 2017 - 2024 , 2011
25. A. Fernandez-Ares, A. Mora, J.J. Merelo, P.G. Sánchez, **C.M. Fernandes**, Optimizing Strategy Parameters in a Game Bot, *Proceedings of the 11th international conference on Artificial neural networks conference on Advances in computational intelligence - Volume Part II*, pp. 325-332, 2011
26. **C.M. Fernandes**, J.L.J. Laredo, Antonio Mora, A.C. Rosa, J.J. Merelo, A Study on the Mutation Rates of a Genetic Algorithm Interacting with a Sandpile, *Proceedings of the 2011 international conference on Applications of evolutionary computation - Volume Part I (EvoApplications'11)*, Cecilia Di Chio et al. (Eds.), Vol. Part I. Springer-Verlag, Berlin, Heidelberg, pp. 32-42, 2011.
27. J.L.J. Laredo, J.J. Merelo, **C.M. Fernandes**, A. Mora, M.G. Arenas, P. Castillo and P. G. Sánchez, Analysing the Performance of Different Population Structures for an Agent-based Evolutionary Algorithm, *Proceedings of the Learning and Intelligent Optimization LION 5, Lecture Notes in Computer Science*, pp. 582-585, 2011
28. **C.M. Fernandes**, J.L.J. Laredo, Antonio Mora, A.C. Rosa, J.J. Merelo, The Sandpile Mutation Operator for Genetic Algorithms, *Proceedings of the Learning and Intelligent Optimization LION 5, Lecture Notes in Computer Science*, pp. 552-556, 2011
29. **C.M. Fernandes**, C. Lima, J.L.J. Laredo, A.C. Rosa, J.J. Merelo, An Ant-Based Rule for UMDAs Update Strategy, *Advances in Artificial Life. Darwin Meets von Neumann*, LNCS 5778, pp 391-398, 2011.

2010

30. **C.M. Fernandes**, J.J. Merelo, A.C. Rosa, Investigating Replacement Strategies for the Adaptive Dissortative Mating Genetic Algorithm, in *Proceedings of the 2nd Joint Conference on Computational Intelligence*, pp. 104-113, 2010.
31. A.M. Mora, **C.M. Fernandes**, L.J. Herrera, P.A. Castillo, J.J. Merelo, Sleeping with Ants, SVMs, Multilayer Perceptrons and SOMs, *Proceedings of the 10th International Conference on Intelligent Systems Design and Applications (ISDA'10)*, pp. 126-131, 2010.
32. J.J. Merelo, A.M. Mora, J.L.J. Laredo, P.A. Castillo, **C.M. Fernandes**, Optimizing Evolutionary Algorithms at Program Level, in *Proceedings of the 2010 International Conference on Metaheuristics and Nature Inspired Computing*, 2010.

33. A.M. Mora, **C.M. Fernandes**, L.J. Herrera, P.A. Castillo, A.C. Rosa, JJ Merelo, **Automatic Sleep Classification Procedure Using Wavelet Based Feature Extraction**, in Proceedings of the 2010 International Conference on Metaheuristics and Nature Inspired Computing, 2010.

2009

34. J.L.J. Laredo, **C.M. Fernandes**, Antonio M. Mora, Pedro A. Castillo, Pablo García-Sánchez, J.J. Merelo. Studying the Cache Size in a Gossip-Based Evolutionary Algorithm. *Studies in Computational Intelligence*, Volume 237/2009, pp. 131-140, 2009
35. J.L.J. Laredo, **C.M. Fernandes**, J.J. Merelo, C. Gagne. Improving Genetic Algorithms Performance via Deterministic Population Shrinkage. In Proceedings of GECCO'09, pp. 819-826, 2009

2008

36. J.L.J. Laredo, P.A. Castillo, A.M. Mora, **C.M. Fernandes**, JJ Merelo. Addressing Churn in a Peer-to-Peer Evolutionary Algorithm. In *Proceedings of 1st International Workshop on Parallel Architectures and Bioinspired Algorithms*, pp. 5-12, 2008.
37. **C.M. Fernandes**, J.J. Merelo, A.C. Rosa. Tracking Extrema in Dynamic Fitness Functions with Dissortative Mating Genetic Algorithms. In *Proceedings of the 8th International Conference on Hybrid Intelligent Systems*, IEEE Computer Society, pp. 59-64, 2008.
38. J.L.J. Laredo, P.A. Castillo P.A., A.M. Mora, J.J. Merelo, A.C. Rosa, **C.M. Fernandes**, Evolvable Agents in Static and Dynamic Optimization Problems. In G. Rudolph, T. Jansen, S. Lucas, C. Poloni and N. Beume (Eds.), *Proceedings of 10th International Conference on Parallel Problem Solving from Nature*, Lecture Notes in Computer Science, Vol. 5199, Springer-Verlag, Berlin, pp. 489-497, 2008.
39. **C.M. Fernandes**, Antonio Mora, Juan-Julian Merelo, Vitorino Ramos, Juan Luís J. Laredo, KANTS: Artificial Ant System for Classification, In *Proceedings of the 6th International Conference on Ant Colony Optimization and Swarm Intelligence (ANTS'2008)*, Lecture Notes in Computer Science, Vol. 5217, Springer-Verlag, Berlin-Heidelberg, pp. 339-346, 2008.
40. A.M. Mora, **C.M. Fernandes**, J.J. Merelo, V. Ramos, J.L.J. Laredo. KohonAnts: A Self-Organizing Ant Algorithm for Clustering and Pattern Classification, In S. Bullock, J. Noble, R. A. Watson, and M. A. Bedau (Eds.), *Proceedings of the 11th International Conference on the Simulation and Synthesis of Living Systems (AlifeXI)*, MIT Press, pp. 428-435, 2008.
41. **C.M. Fernandes**, C. Lima, A.C. Rosa, UMDAs for Dynamic Optimization Problems, In *Proceedings of the 2008 Genetic and Evolutionary Computation Conference (GECCO'2008)*, ACM, NY, New York, USA, pp. 399-406, 2008.
42. C. Lima, **C.M. Fernandes**, F. Lobo. Investigating Restricted Tournament Replacement in ECGA for Non-Stationary Environments (extended version), IlliGAL Technical Report No. 2008010, University of Illinois at Urbana-Champaign, 2008.

43. C. Lima, C.M. Fernandes, F. Lobo. **Investigating Restricted Tournament Replacement in ECGA for Non-Stationary Environments**. In *Proceedings of the 2008 Genetic and Evolutionary Computation Conference (GECCO'2008)*, ACM, NY, New York, USA, pp. 439-446, 2008.

44. C.M. Fernandes, J.J. Merelo, V. Ramos, A.C. Rosa. **A Self-Organized Criticality Mutation Operator for Dynamic Optimization Problems**, In *Proceedings of the 2008 Genetic and Evolutionary Computation Conference (GECCO'2008)*, ACM, NY, New York, USA, pp. 937-844, 2008.

2007

45. V. Ramos, **C.M. Fernandes**, A.C. Rosa, A. Abraham. Computational Chemotaxis in Ants and Bacteria over Dynamic Environments. In *Proceedings of the 2007 IEEE Congress on Evolutionary Computation*, IEEE Press, pp. 1109 - 1117, 2007.

46. **C.M. Fernandes**, A.C. Rosa, V. Ramos. Binary Ant Algorithm. In *Proceedings of the 9th Genetic and Evolutionary Computation Conference*, ACM Press, pp. 41-48, 2007.

47. **C.M. Fernandes**, V. Ramos, A.C. Rosa, Stigmergic Optimization in Dynamic Binary Landscapes. In *Proceedings of the 2007 Symposium on Applied Computing*, ACM Press, pp. 747-748, 2007.

2006

48. **C.M. Fernandes**, A.C. Rosa, Self-Regulated Population Size in Evolutionary Algorithms. In *Proceedings of 9th International Conference on Parallel Problem Solving from Nature*, LNCS Series, Vol. 4193, Springer-Verlag, pp. 920-929, 2006.

49. V. Ramos, **C.M. Fernandes**, A.C. Rosa, On Self-Regulated Swarms, Societal Memory, Speed and Dynamics. In *Proceedings of the 10th International Conference on the Simulation and Synthesis of Living Systems*, MIT Press, 2006.

2005

50. **C.M. Fernandes**, V. Ramos, A.C. Rosa, Varying the Population Size of Artificial Foraging Swarms on Time Varying Landscapes, In *Proceedings of the 15th International Conference on Artificial Neural Networks*, Lecture Notes in Computer Science, Vol. 3696, Part I, Springer-Verlag, pp. 311-316, 2005.

2002

51. **C.M. Fernandes**, J.P. Caldeira, F. Melício, A.C. Rosa, Infected Genes Evolutionary Algorithm for School Timetabling, In *Advances in Intelligent Systems, Fuzzy Systems, Evolutionary Computation*, WSEAS Press, pp. 245- 249, 2002.

2001

52. **C.M. Fernandes**, A.C. Rosa. A Study on Non-random Mating and Varying Population Size in Genetic Algorithms using a Royal Road Function, In *Proceedings of the 2001 IEEE Congress on Evolutionary Computation*, IEEE Press, pp 60-66, 2001.

53. **C.M. Fernandes**, R. Tavares, C. Munteanu, A.C. Rosa, Using Assortative Mating in Genetic Algorithms for Vector Quantization Problems, In *Proceedings of the 2001 ACM Symposium on Applied Computing*, ACM Press, pp. 361-365, 2001.

2000

54. **C.M. Fernandes**, R. Tavares, A.C. Rosa, NiGAVaPS - Outbreeding in Genetic Algorithms, In *Proceedings of the 2000 ACM Symposium on Applied Computing*, ACM Press, pp. 477-482, 2000.

1999

55. **C.M. Fernandes**, F. Melício, J.P. Caldeira, A.C. Rosa, High School Weekly Timetabling by Evolutionary Algorithms, In *Proceedings of the 1999 ACM Symposium on Applied Computing*, ACM Press, pp. 344-350, 1999.
56. **C.M. Fernandes**, J.P. Caldeira, F. Melício, A.C. Rosa, Evolutionary Algorithm for School Timetabling. In *Proceedings of the 1st Genetic and Evolutionary Computation Conference*, Vol. 2, pp. 1777, 1999.

Publications

(essays on art and science)

1. C.M. Fernandes, Creative Leaps, in *ROBOT ARTe* (catalogue of Leonel Moura's exhibition), 2009.
2. C.M. Fernandes, Consilience, in *Inside [Art and Science]* (catalogue of the exhibition with same name, Lisbon), 2009.
3. C.M. Fernandes, Diagrams, in *Diagrams* (foreword of the exhibition's catalogue), 2010

Invited Seminars

Desenhos Ferogénicos e Outras Paisagens Escondidas (in Portuguese), ISCTE, Lisboa, March 2012

Da Photographia à Pherographia – Notas sobre Arte, Ciência e Criatividade (in Portuguese), ISCTE, Lisboa, April 2010

Fotografia, Tecnologia e Ciência (in Portuguese), Encontros do Olhar, Instituto Português de Fotografia, Lisboa, June 2010

Refereing (science journals)

- *Journal of Applied Intelligence*.
- *Natural Computing*.
- *IEEE Transactions on Evolutionary Computation*, IEEE Press.
- *Swarm Intelligence Journal*, Springer.
- *Ecological Modeling Journal*, Elsevier.

Refereing (others)

- Congress on Evolutionary Computation, CEC 2012. Program Committee.
- Genetic and Evolutionary Computation Conference, GECCO 2012. Program Committee.
- International Conference on Evolutionary Computation Theory and Applications, ECTA 2013. Program Committee.
- International Conference on Evolutionary Computation Theory and Applications, ECTA 2012. Program Committee.
- International Conference on Evolutionary Computation Theory and Applications, ECTA 2011. Program Committee.
- Fifteenth Portuguese Conference on Artificial Intelligence (ALEA workshop), 2013. Program Committee.
- Fifteenth Portuguese Conference on Artificial Intelligence (ALEA workshop), 2011. Program Committee.
- Fourteenth Portuguese Conference on Artificial Intelligence (ALEA workshop), 2009. Program Committee.
- IEEE Congress on Computational Intelligence, SSCI 2013. Program Committee.
- IEEE Congress on Evolutionary Computation, CEC 2013. Program Committee.
- IEEE Congress on Evolutionary Computation, CEC 2012. Program Committee.
- IEEE Congress on Evolutionary Computation, CEC 2011. Program Committee.
- IEEE Congress on Evolutionary Computation, CEC 2008. Program Committee.
- Genetic and Evolutionary Computation Conference, GECCO 2012. Program Committee.
- Genetic and Evolutionary Computation Conference, GECCO 2011. Program Committee.
- 2009 ACM Symposium on Applied Computing. Program Committee.
- Thirteen Portuguese Conference on Artificial Intelligence (ALEA workshop), 2007. Program Committee.
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