

José Antonio Martín H.

Machine-learning/Data-scientist.
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Education

- 2009 **PhD**, *Technical University of Madrid (UPM)*, *Doctoral Degree*.
PhD in Computer Science and Artificial Intelligence “Studies on Adaptive Systems with applications in Autonomous Robots and Intelligent Agents” (Spanish)
- 2007 **DEA**, *UNED University*, *Master equivalent degree*.
Advanced Studies Diploma (DEA) in Basic Psychology
- 2004 **DEA**, *Technical University of Madrid (UPM)*, *Master equivalent degree*.
Advanced Studies Diploma (DEA) Computer Science and Artificial Intelligence
- 2002 **BSc, MSc**, *University of Zulia*, *Grade*.
Computer Science Degree. Computer Engineer (2004) by the Spanish Ministry of Education.

Other

- 2002 **Oracle Certified Database Administrator**, *Oracle University*, *OCP*.
- 2002 **Oracle Certified Application Developer**, *Oracle University*, *OCP*.
- 2002 **Oracle Certified Internet Application Developer**, *Oracle University*, *OCP*.

PhD thesis

- Title *Studies on Adaptive Systems with applications to Autonomous Robots and Intelligent Agents (Spain, 2009)*. **With Maximal Honors** (“Sobresaliente Cum Laude”).
- Recognitions **Extraordinary PhD. Award** (2011), by the Technical University of Madrid

Academic positions

- 2010–Now **Assistant Professor**, *Faculty of Computer Science*, Complutense University of Madrid.
- 2005–2010 **Teaching and Research Assistant**, *Faculty of Computer Science*, Complutense University of Madrid.
- 2004–2005 **Research fellow**, *Industrial Automation Institute (IAI)*, Spanish Council for Scientific Research (CSIC).

Professional and Scientific Interests

- Computer Science Machine learning, data science, reinforcement learning, contextual bandits, pattern recognition and machine perception.
- Maths Graph theory and algorithms, graph coloring, computational complexity and prime numbers.

Publications

Google Scholar Citations

<http://scholar.google.com/citations?user=OYHcAXsAAAAJ&hl=en>

Journal Publications

- [1] Jose Antonio Martin H and Ana M. Vargas. Linear bayes policy for learning in contextual-bandits. *Expert Systems With Applications*, 41(1):1–14, November 2013. [DOI]
- [2] Guillermo Botella, José Antonio Martín H., Joaquín Recas, and Concepción Sanz. Modelado de filtros temporales bioinspirados para estimación de movimiento (spanish). *Revista Técnica de Ingeniería de la Universidad del Zulia*, 36(1):13–22, April 2013. [URL]
- [3] José Antonio Martin H. Solving hard computational problems efficiently: Asymptotic parametric complexity 3-coloring algorithm. *PLoS ONE*, 8(1):e53437, January 2013. [DOI] [URL]
- [4] Matilde Santos, Jose Antonio Martin H., Victoria Lopez, and Guillermo Botella. Dyna-h: A heuristic planning reinforcement learning algorithm applied to role-playing game strategy decision systems. *Knowledge-Based Systems*, 32(0):28 – 36, August 2012. [DOI] [URL]
- [5] Guillermo Botella, José Antonio Martín H., Matilde Santos, and Uwe Meyer-Baese. Fpga-based multimodal embedded sensor system integrating low- and mid-level vision. *Sensors*, 11(8):8164–8179, August 2011. [DOI] [URL]
- [6] Jose Antonio Martin H., Javier de Lope, and Dario Maravall. Robust high performance reinforcement learning through weighted k-nearest neighbors. *Neurocomputing*, 74(8):1251 – 1259, March 2011. [DOI] [URL]
- [7] Jose Antonio Martin H., Javier de Lope, and Dario Maravall. Analysis and solution of a predator-protector-prey multi-robot system by a high-level reinforcement learning architecture and the adaptive systems theory. *Robotics and Autonomous Systems*, 58(12):1266 – 1272, November 2010. Intelligent Robotics and Neuroscience. [DOI] [URL]
- [8] José Antonio Martin H., Matilde Santos, and Javier de Lope. Orthogonal variant moments features in image analysis. *Information Sciences*, 180(6):846 – 860, March 2010. [DOI] [URL]
- [9] Andrés García García, José Antonio Martín H., and María Teresa Gutiérrez Domínguez. A computational model for the formation of equivalence classes. *International Journal of Psychology and Psychological Therapy*, 10(1):163–176, March 2010. [URL]
- [10] Jose Antonio Martin H., Javier de Lope, and Dario Maravall. Adaptation, anticipation and rationality in natural and artificial systems: computational paradigms mimicking nature. *Natural Computing*, 8(4):757–775, December 2009. [DOI] [URL]
- [11] Jose Antonio Martin H., Matilde Santos, G. Farias, N. Duro, J. Sanchez, R. Dormido, S. Dormido-Canto, J. Vega, and H. Vargas. Dynamic clustering and modeling approaches for fusion plasma signals. *IEEE Transactions on Instrumentation and Measurement*, 58(9):2969 – 2978, September 2009. [DOI] [URL]
- [12] José Antonio Martin H., Javier de Lope, and Matilde Santos. A method to learn the inverse kinematics of multi-link robots by evolving neuro-controllers. *Neurocomputing*, 72(13-15):2806–2814, August 2009. [DOI] [URL]

- [13] Jose Antonio Martin H. and Javier de Lope. A model for the dynamic coordination of multiple competing goals. *Journal of Experimental & Theoretical Artificial Intelligence*, 21(2):123–136, June 2009. [DOI] [URL]
- [14] Darío Maravall, Javier de Lope, and Jose Antonio Martin H. Hybridizing evolutionary computation and reinforcement learning for the design of almost universal controllers for autonomous robots. *Neurocomputing*, 72(4–6):887–894, January 2009. [DOI] [URL]
- [15] S. Dormido-Canto, G. Farias, J. Vega, R. Dormido, J. Sanchez, N. Duro, M. Santos, and José Antonio Martin H. Search and retrieval of plasma wave forms: Structural pattern recognition approach. *Review of Scientific Instruments*, 77(10), September 2006. [DOI] [URL]

Conference Publications

- [16] Jose Antonio Martin H. Contextual bandits: Approximated linear bayes for large contexts. In Jeremie Marie, editor, *Proceedings of the ICML 2012 Workshop on new Challenges for Exploration & Exploitation 3*, July 2012. [URL]
- [17] José Antonio Martin H. Resumen de tesis doctoral. In *Proceedings of the VIII Simposio CEA de Control Inteligente*, pages 1–6, Logroño. Spain., June 2011. Universidad de la Rioja y Comité Español de Automática. [URL]
- [18] Jose Antonio Martin H, Javier Montero, Javier Yáñez, and Daniel Gómez. A divisive hierarchical k-means based algorithm for image segmentation. In *Intelligent Systems and Knowledge Engineering (ISKE), 2010 International Conference on*, pages 300–304. IEEE, November 2010. [DOI]
- [19] José Antonio Martin H. and Javier de Lope. Ex⟨a⟩: An effective algorithm for continuous actions reinforcement learning problems. In *Proceedings of 35th Annual Conference of the IEEE Industrial Electronics Society*, pages 2063 – 2068, Oporto, Portugal, November 2009. IEEE Industrial Electronics Society, IEEE. [DOI] [URL]
- [20] José Antonio Martin H. and Javier de Lope Asiaín. Learning autonomous helicopter flight with evolutionary reinforcement learning. In Roberto Moreno-Díaz Franz Pichler and Alexis Quesada-Arencibia, editors, *Computer Aided Systems Theory - EUROCAST 2009, 12th International Conference, Las Palmas de Gran Canaria, Spain, February 15-20, 2009, Revised Selected Papers*, volume 5717 of *Lecture Notes in Computer Science*, pages 75–82. Springer Berlin / Heidelberg, September 2009. [DOI] [URL]
- [21] José Antonio Martin H., Javier de Lope Asiaín, and Darío Maravall. Learning to coordinate multi-robot competitive systems by stimuli adaptation. In *Part II, Bioinspired Applications in Artificial and Natural Computation*, volume 5602 of *Lecture Notes in Computer Science*, pages 362–371, Santiago de Compostela, Spain, June 2009. Springer. [DOI]
- [22] José Antonio Martin H., Javier de Lope Asiaín, and Darío Maravall. The knn-td reinforcement learning algorithm. In *IWINAC Part I, Methods and Models in Artificial and Natural Computation*, volume 5901 of *Lecture Notes in Computer Science*, pages 305–314, Santiago de Compostela, Spain, June 2009. Springer. [DOI]
- [23] Javier de Lope, Jose Antonio Martin H, and Darío Maravall. Applying reinforcement learning to modular cooperative robotic systems. In *Multidisciplinary Symposium on Reinforcement Learning*, Montreal, Canada, June 2009. [URL]

- [24] José Antonio Martín H. and Javier De Lope. Learning autonomous helicopter flight with evolutionary reinforcement learning. In Alexis Quesada-Arencibia, José Carlos Rodríguez-Rodríguez, Roberto Moreno-Díaz jr., and Roberto Moreno-Díaz, editors, *Proceedings of the 12th International Conference on Computer Aided Systems Theory EUROCAST 2009*, pages 25–26, Las Palmas de Gran Canaria, Spain, February 2009. IUCTC Universidad de Las Palmas de Gran Canaria.
- [25] José Antonio Martín H, Matilde Santos, Andrés García, and Javier de Lope. A computational model of the equivalence class formation psychological phenomenon. In *Innovations in Hybrid Intelligent Systems*, volume 44 of *Advances in Soft Computing*, pages 104–111, Salamanca, Spain, November 2008. Springer Verlag. [DOI] [URL]
- [26] José Antonio Martín H., Javier de Lope, and Matilde Santos. Evolution of neuro-controllers for multi-link robots. In *Innovations in Hybrid Intelligent Systems*, volume 44 of *Advances in Soft Computing*, pages 175–182, Salamanca, Spain, November 2008. Springer Verlag. [DOI] [URL]
- [27] Yolanda Sanz, Javier de Lope Asiaín, and José Antonio Martín H. Applying reinforcement learning to multi-robot team coordination. In Emilio Corchado, Ajith Abraham, and Witold Pedrycz, editors, *Hybrid Artificial Intelligence Systems, Third International Workshop*, volume 5271 of *Lecture Notes in Computer Science*, pages 625–632, Burgos, Spain, September 2008. Springer. [DOI] [URL]
- [28] José Antonio Martín H and Matilde Santos. Application of orthogonal variant moments to computer vision. In Da Ruan, Javier Montero, Jie Lu, Luis Martínez, Pierre D'hondt, and Etienne E Kerre, editors, *Computational Intelligence In Decision And Control: Proceedings Of The 8th International Flins Conference*, volume 1 of *World Scientific Proceedings Series on Computer Engineering and Information Science*, pages 441–446, Madrid, Spain, September 2008. World Scientific. [DOI] [URL]
- [29] Andrés García, José Antonio Martín H., and Mayte Gutiérrez. A computational model for the formation of equivalence classes. Madrid, Spain, September 2008.
- [30] Jose Antonio Martín H. Approaches for the rl competition 2008. In *25th international conference on machine learning (ICML 2008) - Second annual reinforcement learning competition (RL 2008)*, Helsinki, Finland, July 2008.
- [31] José Antonio Martín H. and Javier de Lope. A k-nn based perception scheme for reinforcement learning. In Roberto Moreno Díaz, Franz Pichler, and Alexis Quesada Arencibia (Eds.), editors, *Computer Aided Systems Theory - EUROCAST 2007, Revised Selected Papers*, volume 4739 of *Lecture Notes in Computer Science*, pages 138–145, Las Palmas de Gran Canaria, Spain, November 2007. Springer Berlin / Heidelberg. [DOI] [URL]
- [32] Javier de Lope, Juan San Martín, and Jose Antonio Martín H. Helicopter flight dynamics using soft computing models. In Roberto Moreno Díaz, Franz Pichler, and Alexis Quesada Arencibia (Eds.), editors, *Computer Aided Systems Theory - EUROCAST 2007, Revised Selected Papers*, volume 4739 of *Lecture Notes in Computer Science*, pages 621–628, Las Palmas de Gran Canaria, Spain, November 2007. Springer Berlin / Heidelberg. [DOI] [URL]
- [33] Jose Antonio Martín H., Matilde Santos, G. Farias, N. Duro, J. Sanchez, R. Dormido, S. Dormido-Canto, and J. Vega. Dynamic clustering and neuro-fuzzy identification for the analysis of fusion plasma signals. In *2007 IEEE International Symposium on Intelligent*

Signal Processing, IEEE, pages 979–984, Alcalá de Henares, Spain, October 2007. IEEE, IEEE. [DOI]

- [34] José Antonio Martín H. and Javier de Lope. Concepts and models for the future generation of emotional and intelligent systems. In José Mira and José R. Álvarez, editors, *Bio-inspired Modeling of Cognitive Tasks*, volume 4527 of *Lecture Notes in Computer Science*, pages 41–50, La Manga del Mar Menor, Spain, June 2007. Springer. [DOI] [URL]
- [35] Darío Maravall, Javier de Lope, and Jose Antonio Martín H. Combining the best of the two worlds: Inheritance versus experience. In José Mira and José R. Álvarez, editors, *Nature Inspired Problem-Solving Methods in Knowledge Engineering*, volume 4528 of *Lecture Notes in Computer Science*, pages 337–346, La Manga del Mar Menor, Spain, June 2007. Springer. [DOI] [URL]
- [36] José Antonio Martín H. and Javier de Lope. A distributed reinforcement learning control architecture for multi-link robots - experimental validation. In Janan Zaytoon, Jean-Louis Ferrier, Juan Andrade-Cetto, and Joaquim Filipe, editors, *ICINCO-ICSO*, pages 192–197, Angers, France, May 2007. INSTICC Press.
- [37] José Antonio Martín H. and Javier De Lope. A k-nn based perception scheme for reinforcement learning. In Alexis Quesada-Arencibia, José Carlos Rodríguez-Rodríguez, Roberto Moreno-Díaz jr., and Roberto Moreno-Díaz, editors, *Computer Aided Systems Theory EUROCAST 2007*, pages 55–57, Las Palmas de Gran Canaria, Spain, February 2007. IUCTC Universidad de Las Palmas de Gran Canaria.
- [38] Javier de Lope, Juan San Martín, and Jose Antonio Martín H. Helicopter flight dynamics using soft computing models. In Alexis Quesada-Arencibia, José Carlos Rodríguez-Rodríguez, Roberto Moreno-Díaz jr., and Roberto Moreno-Díaz, editors, *Computer Aided Systems Theory EUROCAST 2007*, pages 219–220, Las Palmas de Gran Canaria, Spain, February 2007. IUCTC Universidad de Las Palmas de Gran Canaria.
- [39] José Antonio Martín H. and Javier de Lope. Dynamic goal coordination in physical agents. In Juan Andrade-Cetto, Jean-Louis Ferrier, José Dias Pereira, and Joaquim Filipe, editors, *Proceedings of the 3rd International Conference on Informatics in Control, Automation and Robotic*, pages 154–159, Setúbal, Portugal, August 2006. INSTICC Press.
- [40] Jose Antonio Martín H., Matilde Santos, , G. Pajares, G. Farias, N. Duro, J. Sanchez, R. Dormido, S. Dormido-Canto, J. Vega, M. Ruiz, E. Barrera, and S. Lopez. Approach to real-time event detection in continuous data flows based on neuro-fuzzy models. In *16th Annual Conference on High-Temperature Plasma Diagnostics. Abstracts Book*, Williamsburg, VA, May 2006.
- [41] Jose Antonio Martín H. and Matilde Santos. Orthogonal variant moments in computer vision. In *International e-conference of computer science 2006*, volume 8 of *Lecture Series on Computer and Computational Science*, pages 163–166. VSP Brill, 2006. [URL]
- [42] Jose Antonio Martín H. Hidden edges in graph coloring. In *International e-conference of computer science 2006*, volume 8 of *Lecture Series on Computer and Computational Science*, pages 167–170. VSP Brill, 2006. [URL]
- [43] Jose Antonio Martín H., Teresa de Pedro, Carlos González, Ricardo García, Luís Argüelles, Jose Rivas, and Javier Toraño. Fuzzy modeling for coal seams A case study for a hard-coal mine. In Roberto Moreno-Díaz, Franz Pichler, and Alexis Quesada-Arencibia, editors,

Computer Aided Systems Theory EUROCAST 2005, Revised Selected Papers, volume 3643 of *Lecture Notes in Computer Science*, pages 33–37, Las Palmas de Gran Canaria, Spain, October 2005. Springer Berlin / Heidelberg. [DOI]

- [44] Jose Antonio Martín H., Carlos González, Ricardo García Rosa, and de Pedro. Teresa. A fuzzy expressions processor with modifiers and hedges, conceptual design and tests. In Eduard Montseny and Pilar Sobrevilla, editors, *Proceedings of the Fourth Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT 2005) and Eleventh Rencontres Francophones sur la Logique Floue et ses Applications (LFA 2005)*, pages 357–362, Barcelona, Spain, September 2005. EUSFLAT, Universidad Polytechnica de Catalunya. [URL]
- [45] Jose Antonio Martin H. Search space modulation in genetic algorithms: evolving the search space by sinusoidal transformations. In Hans-Georg Beyer and Una-May O'Reilly, editors, *Proceedings of the 2005 conference on Genetic and evolutionary computation*, pages 1559–1560, Washington D.C., USA, June 2005. ACM. [DOI] [URL]
- [46] Jose Antonio Martin H. Physical traveling salesperson problem for gecco 2005. Washington D.C. USA, June 2005. GECCO 2005, ACM. [URL]
- [47] Jose Antonio Martin H., Teresa de Pedro, Carlos González, Ricardo García, Luís Argüelles, Jose Rivas, and Javier Toraño. Fuzzy modeling for coal seams A case study for a hard-coal mine. In Alexis Quesada-Arencibia, Roberto Moreno-Díaz jr., and Roberto Moreno-Díaz, editors, *Cast and Tools for Robotics, Vehicular and Communication Systems, EUROCAST 2005*, pages 13–14, Las Palmas de Gran Canaria, Spain, February 2005. IUCTC Universidad de Las Palmas de Gran Canaria.
- [48] Jose Antonio Martin H. and Javier Alonso Ruiz. Formalización de maniobras en robots con múltiples grados de libertad como sistemas multiagente. In Juan Pavon Mestras Juan Carlos Gonzalez Moreno, Pedro Cuesta Morales, editor, *Proceedings of the IX Jornadas de Ingeniería del Software y Bases de Datos JISBD, DESMA.*, volume 1, pages 38–47, Malaga, España, November 2004. Universidad de Malaga, España. [URL]

Patents

- 19/01/2007 **Patent**, José Antonio Martín Hernández., Spain, 2244335 B1.
TELEMATICS SERVICE FOR THE ASSOCIATION OF UNIQUE VEHICLE IDENTIFIERS WITH TELECOMMUNICATIONS DEVICES

Honors, Prizes, Achievements and Awards

- 2012 Second Place (JAMH Team) Exploration and Exploitation 3 Challenge on Yahoo! dataset (to serve-recommend news articles on Yahoo! Front Page). ICML2012
- 2011 **Extraordinary PhD. Award** by the Technical University of Madrid. I have obtained the 20th award from over 140 PhDs in the same PhD. programme from the academic year 1985-86 to the present.
- 2009 First Place -**Winner**- (JAMH Team) of the Helicopter Hovering Domain at the 2009 International Reinforcement Learning Competition. ICML2009
- 2009 Second Place (JAMH Team) of the PolyAthlon Domain at the 2009 International Reinforcement Learning Competition. ICML2009
- 2008 First Place -**Winner**- (JAMH Team) of the PolyAthlon Domain at the 2008 International Reinforcement Learning Competition. ICML2008

- 2008 Second Place (JAMH Team) of the MountainCar Domain at the 2008 International Reinforcement Learning Competition. ICML2008
- 2004-2005 **Research Fellow** from the Industrial Automation Institute (IAI) of the Spanish National Research Council (CSIC).

Service

- Reviewer for the Journal:** Pattern Recognition Letters (elsevier).
- Session-Chair** at the International Conference on Informatics in Control, Automation and Robotics -ICINCO 2007- (Robotics and Automation Session).
- Organizer** of the FLINS 2008 Int. Conference in Madrid, Spain September 2008.
- Member of the technical committee** of the Third Annual Reinforcement Learning Competition (part of the 2009 International Conference on Machine Learning ICML 09 in Montreal, Canada).
- Session Co-Chair** at the third International Work-conference on the Interplay between Natural and Artificial Computation IWINAC 2009 (Bioinspired applications III).
- Member of the Program Committee** of ICPRAM 2012 (International Conference on Pattern Recognition Applications and Methods)
- Reviewer for the Journal:** Sensors, MDPI AG, Postfach, CH-4005 Basel, Switzerland
- PhD External Examiner:** Computer Science National Institute of Astrophysics, Optics and Electronics (INAOE), MEXICO 2011
- Member of the Program Committee** of EWRL2012 (European Workshop On Reinforcement Learning 2012)

Computer science/engineering positions

- 2003 **Tech. Lead, AXPE Consulting, SIEMENS, Spanish National Institute of Statistics, Madrid, Spain.**
Elaboration of a prototype of the Information System to be used for the analysis, presentation and publication of the 2002 population census of Spain.
- 2000–2002 **Programmer Analyst, ITTACA - INTESA - SAIC, Maracaibo.**
Design and development of Data-Warehouse and Data-mining applications for the analysis of very large databases of petroleum exploration and production

Programming languages

Any	Novice	<i>I can quickly learn to program in any tool.</i>
Python	Expert	<i>Numpy, scipy, pandas, matplotlib, scikit learn, orange, networkx, etc...</i>
Matlab	Expert	
C, C++, Java	Professional level	<i>Ready to work at a professional level.</i>
SQL, Oracle PL/SQL	Professional level	<i>Ready to work at a professional level.</i>

Recreational Interests

- Music Singing, play guitar (electric, acoustic and bass guitar), piano, keyboards and composition.
- Sports Play chess, tennis, table tennis, football and baseball.
- Gastronomy I really enjoy to cook (and eat!) delicious and creative food.

Affiliations

- Mensa
- ACM
- IEEE, Systems, Man and Cybernetics
- SIG-EVO, ACM Special Interest group on Evolutionary Computation
- SIGACT
- Animal Behavior Society
- ISAB, The International Society for Adaptive Behavior