

Artificial Intelligence techniques for big data analysis

Aditya Khatri¹

¹P P Savani University.
Dhamdod, Kosamba, Surat district, Gujarat, India.
khatriaditya90@gmail.com

Abstract. During my stay in Salamanca (Spain), I was fortunate enough to participate in the BISITE Research Group of the University of Salamanca. The University of Salamanca is the oldest university in Spain and in 2018 it celebrates its 8th centenary.

As a computer science researcher, I participated in one of the many international projects that the research group has active, especially in big data analysis using Artificial Intelligence (AI) techniques [11][5].

AI is one of BISITE's main lines of research, along with bioinformatics [6][8] and robotics [9].

In addition, they combine all these fields working with Internet of Things (IoT) [1][7] in all its parts: sensors, communications[2], data analysis [4] using Big Data techniques and visualization software [10] with the latest technologies.

I also read really useful scientific articles related to AI like those listed in [12-47].

Keywords: Artificial Intelligence, Big Data, Internet of Things, IoT, Sensors

References

1. Chamoso, P., De la Prieta, F., De Paz, F., & Corchado, J. M. (2015). Swarm agent-based architecture suitable for internet of things and smartcities. In *Distributed Computing and Artificial Intelligence*, 12th International Conference (pp. 21-29). Springer, Cham.
2. Chamoso, P., Raveane, W., Parra, V., & González, A. (2014). UAVs applied to the counting and monitoring of animals. In *Ambient Intelligence-Software and Applications* (pp. 71-80). Springer, Cham.
3. Chamoso, P., Raveane, W., Parra, V., & González, A. (2014). UAVs applied to the counting and monitoring of animals. In *Ambient Intelligence-Software and Applications* (pp. 71-80). Springer International Publishing.
4. Chamoso, P., De Paz, J. F., Bajo, J., & Villarrubia, G. (2017). Agent-based tool to reduce the maintenance cost of energy distribution networks. *Knowledge and Information Systems*, 1-17.
5. Chamoso, P., Rivas, A., Rodríguez, S., & Bajo, J. (2018). Relationship recommender system in a business and employment-oriented social network. *Information sciences*, 1-13.

6. Garcia-Ortiz, L., Perez-Ramos, H., Chamoso-Santos, P., Recio-Rodriguez, J. I., Garcia-Garcia, A., Maderuelo-Fernandez, J. A., ... & Sanchez-Salgado, B. (2016). [PP. 08.02] AUTOMATIC IMAGE ANALYZER TO ASSESS RETINAL VESSEL CALIBER (ALTAIR) TOOL VALIDATION FOR THE ANALYSIS OF RETINAL VESSELS. *Journal of Hypertension*, 34, e160.
7. González-Briones, A. (2017). Últimas tendencias en aplicación de soluciones IoT en el medioambiente. II Congreso de Derecho Ambiental Contemporáneo (España/Brasil), Salamanca.
8. Alfonso, G. B. Application of Clustering and Biclustering Techniques to Yeast Metabolic Cycle.
9. Martín-Martín, P., González-Briones, A., Villarrubia, G., & De Paz, J. F. (2017, June). Intelligent Transport System Through the Recognition of Elements in the Environment. In *International Conference on Practical Applications of Agents and Multi-Agent Systems* (pp. 470-480). Springer, Cham.
10. Pérez, A., Chamoso, P., Parra, V., & Sánchez, A. J. (2014, July). Ground vehicle detection through aerial images taken by a UAV. In *Information Fusion (FUSION), 2014 17th International Conference on* (pp. 1-6). IEEE.
11. Villarrubia, G., De Paz, J. F., Chamoso, P., & De la Prieta, F. (2018). Artificial neural networks used in optimization problems. *Neurocomputing*, 272, 10-16. ISO 690
12. J Bajo, JM Corchado, Y De Paz, JF De Paz, S Rodríguez, Q Martín, A. Abraham, SHOMAS: Intelligent guidance and suggestions in shopping centres, *Applied Soft Computing* 9 (2), 851-862
13. JF De Paz, S Rodríguez, J Bajo, JM Corchado, Case-based reasoning as a decision support system for cancer diagnosis: A case study, *International Journal of Hybrid Intelligent Systems* 6 (2), 2009, 97-110
14. JM Corchado, M Glez-Bedia, Y De Paz, J Bajo, JF De Paz, Replanning mechanism for deliberative agents in dynamic changing environments, *Computational Intelligence* 24 (2), 2008, 77-107
15. JM Corchado, B Lees, Adaptation of cases for case based forecasting with neural network support, *Soft computing in case based reasoning*, 2001, 293-319
16. JMC Rodríguez, *Redes Neuronales Artificiales: un enfoque práctico*, 2000
17. C Zato, G Villarrubia, A Sánchez, I Barri, E Rubión, A Fernández, C. Rebate, J.A. Cabo, T. Álamos, J. Sanz, J. Seco, J. Bajo, J.M. Corchado, PANGEA—Platform for Automatic coNstruction of orGanizations of intElligent Agents, *Distributed Computing and Artificial Intelligence*, 2012, 229-239
18. JM Corchado, J Aiken, Hybrid artificial intelligence methods in oceanographic forecast models, *IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews)*, 32(4), 2002, 307-313
19. S Rodríguez, B Pérez-Lancho, JF De Paz, J Bajo, JM Corchado, Ovamah: Multiagent-based adaptive virtual organizations, *Information Fusion*, 2009. FUSION'09. 12th International Conference on, 2009, 990-997
20. C Fyfe, JM Corchado, Automating the construction of CBR Systems using Kernel Methods, *International Journal of Intelligent Systems* 16 (4), 2001, 571-586
21. B Baruque, E Corchado, A Mata, JM Corchado, A forecasting solution to the oil spill problem based on a hybrid intelligent system, *Information Sciences* 180 (10), 2010, 2029-2043
22. J Bajo, V Julián, JM Corchado, C Carrascosa, Y de Paz, V Botti, JF de Paz, An execution time planner for the ARTIS agent architecture, *Engineering Applications of Artificial Intelligence* 21 (5), 2008, 769-784

23. DI Tapia, JF De Paz, S Rodríguez, J Bajo, JM Corchado, Multi-agent system for security control on industrial environments, *International Transactions on System Science and Applications Journal* 4 (3), 2008, 222-226
24. JM Corchado, ES Corchado, J Aiken, C Fyfe, F Fernandez, M Gonzalez, Maximum likelihood Hebbian learning based retrieval method for CBR Systems, *International Conference on Case-Based Reasoning*, 2003, 107-12
25. RS Alonso, DI Tapia, J Bajo, Ó García, JF de Paz, JM Corchado, Implementing a hardware-embedded reactive agents platform based on a service-oriented architecture over heterogeneous wireless sensor Networks, *Ad Hoc Networks* 11 (1), 2013, 151-166
26. J Bajo, ML Borrajo, JF De Paz, JM Corchado, MA Pellicer, A multi-agent system for web-based risk management in small and medium business, *Expert Systems with Applications* 39 (8), 2012, 6921-6931
27. S Rodríguez, V Julián, J Bajo, C Carrascosa, V Botti, JM Corchado, Agent-based virtual organization architecture, *Engineering Applications of Artificial Intelligence* 24 (5), 2011, 895-910
28. J Bajo, JF De Paz, S Rodríguez, A González, Multi-agent system to monitor oceanic environments, *Integrated Computer-Aided Engineering* 17 (2), 2010, 131-144
29. CI Pinzon, JF De Paz, A Herrero, E Corchado, J Bajo, JM Corchado, idMAS-SQL: intrusion detection based on MAS to detect and block SQL injection through data mining, *Information Sciences* 231, 2013, 15-31
30. JM Corchado, J Bajo, JF De Paz, S Rodríguez, An execution time neural-CBR guidance assistant, *Neurocomputing* 72 (13), 2009, 2743-2753
31. Chamoso, P., Raveane, W., Parra, V., González, A. (2014). UAVs applied to the counting and monitoring of animals. In *Ambient Intelligence-Software and Applications* (pp. 71-80). Springer International Publishing.
32. Briones, A. G., Rodríguez, J. M. C., de Paz Santana, J. F. Sistema de predicción de edad en rostros. *Avances en Informática y Automática*, 125.
33. ML Borrajo, JM Corchado, ES Corchado, MA Pellicer, J Bajo, Multi-agent neural business control system, *Information Sciences* 180 (6), 2010, 911-927
34. Phillips, P. J., Wechsler, H., Huang, J., Rauss, P. J. (1998). The FERET database and evaluation procedure for face-recognition algorithms. *Image and vision computing*, 16(5), 295-306.
35. JF De Paz, S Rodríguez, J Bajo, JM Corchado, Mathematical model for dynamic case-based planning, *International Journal of Computer Mathematics* 86 (10-11), 2009, 1719-1730
36. JF De Paz, DI Tapia, RS Alonso, CI Pinzón, J Bajo, JM Corchado, Mitigation of the ground reflection effect in real-time locating systems based on wireless sensor networks by using artificial neural Networks, *Knowledge and information systems*, 2013, 1-25
37. JF De Paz, J Bajo, VF López, JM Corchado, Biomedic Organizations: An intelligent dynamic architecture for KDD, *Information Sciences* 224, 2013, 49-61
38. JF De Paz, J Bajo, A González, S Rodríguez, JM Corchado, Combining case-based reasoning systems and support vector regression to evaluate the atmosphere-ocean interaction, *Knowledge and information systems* 30 (1), 2012, 155-177
39. C Pinzón, JF De Paz, J Bajo, Á Herrero, E Corchado, AIIDA-Sql: An adaptive intelligent intrusion detector agent for detecting sql injection attacks, *Hybrid Intelligent Systems (HIS)*, 2010 10th International Conference on, 2010, 73-78

40. S Rodríguez, JF De Paz, G Villarrubia, C Zato, J Bajo, JM Corchado, Multi-agent information fusion system to manage data from a WSN in a residential home, *Information Fusion* 23, 2015, 43-57
41. G Villarrubia, J Bajo, JF De Paz, JM Corchado, Monitoring and detection platform to prevent anomalous situations in home care, *Sensors* 14 (6), 2014, 9900-9921
42. C Zato, JF De Paz, A de Luis, J Bajo, JM Corchado, Model for assigning roles automatically in e-government virtual organizations, *Expert Systems with Applications* 39 (12), 2012, 10389-10401
43. JA Fraile, Y De Paz, J Bajo, JF De Paz, B Pérez-Lancho, Context-aware multiagent system: Planning home care tasks, *Knowledge and information systems* 40 (1), 2014, 171-203
44. S Heras, F De la Prieta, V Julian, S Rodríguez, V Botti, J Bajo, J.M. Corchado, Agreement technologies and their use in cloud computing environments, *Progress in Artificial Intelligence* 1 (4), 2012, 277-290
45. P Chamoso, & F De La Prieta. Swarm-Based Smart City Platform: A Traffic Application, *Advances in Distributed Computing and Artificial Intelligence Journal* 4 (2), 2015, 89-98.
46. P Chamoso, F De la Prieta, J Bajo, & JM Corchado. Conflict resolution with agents in smart cities. In *Interdisciplinary Perspectives on Contemporary Conflict Resolution*, 2016, (pp. 244-262). IGI Global.
47. F De la Prieta, S Rodríguez, J Bajo, JM Corchado, A multiagent system for resource distribution into a Cloud Computing environment, *International Conference on Practical Applications of Agents and Multi-Agent Systems*, 2013, 37-48