Curriculum Vitae

Personal information

Surname / First name	**Arjona Medina, Jose Antonio**
Address	Gürtelstraße 19/5/15, 4020 Linz, Austria
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Nationality	Spanish
Date of birth	16 June 1985

Bio

I'm a research scientist educated in Telecommunications, Machine Learning and Artificial Intelligence. In 2017 I finished my Doctorate with honours at the University of Málaga. Part of my Doctorate studies were granted with a Marie Curie fellowship which gave me the opportunity of doing my research at the Research Institute for Symbolic Computation (RISC) Software GmbH in Hagenberg, Upper Austria.

Currently I'm working at the Institute for Machine Learning, headed by Univ.-Prof. Sepp Hochreiter, at the Johannes Kepler University Linz. My current duties are pure research of fundamental problems in Reinforcement Learning, teaching and supervising students.

Research topics

Artificial Intelligence
Reinforcement Learning
Deep Learning
Neural Networks
Comparative Genomics
Bioinformatics Algorithms

For more information go to http://arjonamedina.com

Honours, Awards and Fellowships

2019 **Second best doctoral thesis** in the program *Software Engineering and Artificial intelligence* in the 2017-2018 promotion.

2017 **Doctoral thesis honours: *"Sobresaliente Cum laude"* and *"Mención Europea"***. Dissertation: "Algorithms and methods for large-scale genome rearrangements identification".

2014 **Marie Curie Actions fellowship**
Industry Academia Partnerships and Pathways (IAPP). MrSymbiomath project.

2007 **Final Project Degree with honours**
Segmentation and 3D reconstruction of bone tissue in medical imaging from computerized axial tomography.

Education and training

Higher education

2017 **Doctor**
University of Málaga, Spain
Program: Software Engineering and Artificial Intelligence.
Supervisor: Univ.-Prof. Dr. Oswaldo Trelles.

2013 **Master Degree on Software Engineering and Artificial Intelligence**
University of Málaga, Spain.
Main fields: Evolutionary Algorithms, Multi-agent Systems, Machine Learning, Neural Networks and Fuzzy Systems.
Master tesis: *Incorporación de eventos evolutivos en las medidas de distancia entre genomas.*

2011 **Master Degree on Electronics Systems for Intelligent Environments**
University of Málaga, Spain.
Main fields: Computational Intelligence, Methodology of Planning, Management and Development Projects, Advanced Electronic Systems Components, Design of FPGA Systems.
Master tesis: *Sistema de detección de clientes para un hotel inteligente*.

2008 **Pedagogical Certificate Aptitude**
University of Málaga, Spain.
Main fields: History of Education, Educational Didactic, Educational Psychology.

2007 **Technical Telecommunications Engineering**
University of Málaga, Spain.
Main fields: Linear circuit and system analysis, Electronic components and circuits, Physical fundamentals of engineering, Mathematical fundamentals of engineering, Acoustic systems engineering, Projects, Television, Digital image processing, Multimedia systems.
Final project degree: *Segmentation and 3D reconstruction of bone tissue in medical imaging from computerized axial tomography*. With honours.

2007 **Professional Intermediate-level Music**
Manuel Carra Professional Conservatory. Málaga, Spain.
Main fields: Piano, Harmony, Counterpoint, History of Music.

Seminars

2015	**Mr. SymBioMath Autumn School: industrial perspective of research projects.** Johannes Kepler University Linz, Austria.
2014	**Machine Learning and Visualization Summer School** Leibniz Supercomputing Centre. Munich, Germany.
2013	**Mr.Symbiomath workshop on Integromics Software** Perkin Elmer (former Integromics S.L.). Granada, Spain.
2013	**Summer School on Bioinformatics, Biomedicine, and Cloud Computing.** University of Málaga, Spain.

Additional Training

2014	**Master Study Bioinformatics** (Unfinished) Subjects: Machine Learning: Supervised Techniques, Machine Learning: Unsupervised Techniques, Machine Learning: Theoretical concepts, Deep Learning, Kommunikative Fertigkeiten Englisch (B2), Academic Writing English (C1). Johannes Kepler University Linz, Austria.

Work experience

2016 – present	**Research assistant** Institute for Machine Learning. Head of Institute: Univ.-Prof. Dr. Sepp Hochreiter. Johannes Kepler University Linz, Austria. Proj: Einsatz von Long Short Term Memory (LSTM) für self-driving automotion. Audi Electronics Venture GmbH
2014 – 2016	**Research assistant** Research Institute for Symbolic Computation (RISC) Software GmbH. Hagenberg, Austria. Proj: High Performance, Cloud and Symbolic Computing in Big-Data problems applied to mathematical modeling of Comparative Genomics (mrSymBioMath) Industry-Academia Partnership and Pathways (IAPP) – Marie Curie Programme-EU.
2013 – 2014	**Research assistant** Computer Architecture department. University of Málaga, Spain. Proj: Red de Investigación de Reacciones Adversas a Alergenos y fármacos (RIRAAF) RD12/0013.
2009 – 2012	**High School Teacher** Junta de Analucia, Spain. Fields: Technology, Analogue and digital electronic, Project development, Maths, Visual arts. Carried out duties: Group tutor, Extracurricular activities working group, learning project collaborator.

Undergraduated work experience

2007	**Computer and electronic devices agent** Grandes Almacenes FNAC España SA. Málaga, Spain.

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2006	**Office IT online tutor**
	EMFOR formación SL.
	Málaga, Spain.

Publications

Selected publications

2019	**RUDDER: Return Decomposition for Delayed Rewards**
	José Arjona-Medina, Michael Gillhofer, Michael Widrich, Thomas Unterthiner, Johannes Brandstetter, Sepp Hochreiter.
	https://arxiv.org/abs/1806.07857
	Neural Information Processing Systems (NIPS), 2019 (under review).

2016	**Speeding up Semantic Segmentation for Autonomous Driving**
	*Michael Treml, **José Arjona-Medina**, Thomas Unterthiner, Rupesh Durgesh, Felix Friedmann, Peter Schuberth, Andreas Mayr, Martin Heusel, Markus Hofmarcher, Michael Widrich, Bernhard Nessler, Sepp Hochreiter.*
	Machine Learning for Intelligent Transportation Systems, in conjunction with Neural Information Processing Systems (NIPS), 2016.

Journals

2016	**Refining borders of genome-rearrangements including repetitions**
	Jose Arjona-Medina and O. Trelles.
	BMC Genomics. 17(Suppl 8):804. DOI:10.1186/s12864-016-3069-4, 2016

2016	**Computational workflow for the fine-grained analysis of metagenomic samples**
	*E. Pérez-Wohlfeil, **Jose Arjona-Medina**, O. Torreño-Tirado, E. Ulzurrun, O. Trelles*
	BMC Genomics. 17(Suppl 8):802. DOI:10.1186/s12864-016-3063-x, 2016

2016	**Computational Synteny Block: A framework to identify Evolutionary Events**
	Jose Arjona-Medina and Oswaldo Trelles
	IEEE Transactions on NanoBioscience, 2016, 15 (4)pp. 1–11

Conferences

2016	**Refining borders of genome-rearrangements using repetitions**
	***J. A. Arjona-Medina** and O. Trelles*
	SolBio International Conference 2016 on "Bioinformatics & Computational Biology for Innovative Genomics" April, 2016. Riviera Maya, México.

2016	**Computational workflow for the fine-grained analysis of metagenomic samples**
	*Esteban Pérez-Wohlfeil, **José Arjona-Medina**, Óscar Torreño-Tirado, Eugenia Ulzurrun, Oswaldo Trelles*
	SolBio International Conference 2016 on "Bioinformatics & Computational Biology for Innovative Genomics" April, 2016. Riviera Maya, México.

2016	**High resolution refinement of Large Scale Genomic Rearrangements using repetitions: A case study**
	***J. A. Arjona-Medina**, G. Thode, O. Trelles*
	15th European Conference on Computational Biology (ECCB) 2016.

2016	**GECKO-MGV: Evolution Events driven tool for enhanced visual analysis of multi-genome comparisons**

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*S. Díaz Del Pino, **J. A. Arjona-Medina**, O. Torreño, S. Benavides and O. Trelles*

International Work-Conference on Bioinformatics and Biomedical Engineering IWB-BIO 2016. April, 2016. Granada, Spain.

2015 | **Computational Synteny Block: A framework to identify Evolutionary Events**
Jose A. Arjona-Medina and Oswaldo Trelles

IEEE International Conference on Bioinformatics and Biomedicine (BIBM), 2015, pp. 5–12. Washington D.C., United States.

2014 | **Experimental Study of Local Alignment Distributions in the Comparison of Large Genomic Sequences**
Jose A. Arjona-Medina, Oscar Torreño Tirado, Noura Chelbat and Oswaldo Trelles

ISCB-Latin America x-Meeting on Bioinformatics with BSB & SoiBio. Belo Horizonte, Brazil October 28 - 30, 2014.

2014 | **Software for featuring genome evolution**
Jose A. Arjona-Medina, Oscar Torreño Tirado, and Oswaldo Trelles

European Conference on Computational Biology, Strasbourgh, France, 7th - 10th of September 2014.

2013 | **Digital Signal Processing applied to the identification of Evolutionary Events**
Jose A. Arjona-Medina, Oscar Torreño Tirado and Oswaldo Trelles

4to Congreso Argentino de Bioinformática y Biología Computacional y 4ta Conferencia Internacional de la Sociedad Iberoamericana de Bioinformática (SoIBio).

2009 | **Implantación de una plataforma educativa en un Centro de Secundaria**
Jose A. Arjona-Medina

I Congreso Internacional sobre Usos y Buenas Prácticas con TIC: La web 2.0. Universidad de Málaga, 2009.

Book chapters

2019 | **Explaining and Interpreting LSTMs with LRP**
*Leila Arras, **Jose Arjona-Medina**, Michael Widrich, Grégoire Montavon, Michael Gillhofer, Klaus-Robert Müller, Sepp Hochreiter, Wojciech Samek.*

Book title: Interpretable AI: Interpreting, Explaining and Visualizing Deep Learning.

Editor: Wojciech Samek, Grégoire Montavon, Andrea Vedaldi, Lars Kai Hansen, Klaus-Robert Müller.

Publisher: Springer Lecture Notes in Computer Science.

to appear 2019

2019 | **Visual Scene Understanding for Autonomous Driving using Semantic Segmentation**
*M. Hofmarcher, T. Unterthiner, **J. Arjona-Medina**, G. Klambauer, S. Hochreiter, B. Nessler.*

Book title: Interpretable AI: Interpreting, Explaining and Visualizing Deep Learning

Editor: Wojciech Samek, Grégoire Montavon, Andrea Vedaldi, Lars Kai Hansen, Klaus-Robert Müller.

Publisher: Springer Lecture Notes in Computer Science.

to appear 2019

University teaching experience

2019 | **Deep Reinforcement Learning**
Johannes Kepler University Linz, Austria.

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2019	**Exercises in Machine Learning: Unsupervised Techniques**
	Johannes Kepler University Linz, Austria.
2019	**Exercises in Machine Learning: Theoretical Concepts**
	Johannes Kepler University Linz, Austria.
2015	**Special Topics in Bioinformatics: Breaking the computational barriers in pairwise genome comparison**
	Johannes Kepler University Linz, Austria.

Dissemination activities

2016	**Practical course on Galaxy**
	SolBio International Conference 2016 on "Bioinformatics & Computational Biology for Innovative Genomics"
	Riviera Maya, Mexico.
2016	**Lange Nacht der Forschung**
	MrSBM activities
	http://www.mrsymbiomath.eu/lnf/. Hagenberg, Austria
2015	**Propedéutica y bases de datos**
	I Jornadas de Formación en Bioinformática http://www.bitlab-es.com/jfbi/. Málaga, Spain
2014	**An introduction to Bioinformatics**
	I.E.S Torre Atalaya (High School). Málaga, Spain
2014	**Comparative Genomics: An approach for pre-university students**
	I.E.S Puerto de la Torre (High School). Málaga, Spain
2013	**Supercomputers and DNA: Computing the *bases* of life**
	Andalucia researchers' Night. Málaga, Spain

Conceded projects

2014	**Redes, infraestructuras y cooperacion europea en Bioinformatica: "I Jornadas de formación en Bioinformatica"**
	Junta de Andalucía: ayuda para la realización de actividades informativas, divulgativas y de formación relacionadas con la Unión Europea (3.840 Euros), expediente A-17 14. PI: Dr Oswaldo Trelles. http://www.bitlab-es.com/jfbi/

Personal skills and competences

Mother tongue	**Spanish**
Other language(s)	English (C1)
	German (A2)
Citations	Link to Jose A. Arjona-Medina Google scholar profile
Personal skills	Creativity, teamwork, open-minded, self-taught.
Computer skills	Python, Tensorflow, C, C++, bash, R, Matlab, LaTeX
Artistic skills	Piano, Saxophone

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