Antonio Rueda Toicen

Personal website: www.digital-spaceti.me
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Current positions

Instructor & Researcher
Instituto Nacional de Bioingeniería, Universidad Central de Venezuela
since April 2017

Software Engineer
Algorithmic Nature Group, LABORES for the Natural and Digital Sciences
since January 2015

Operational and Production Manager
ItBit Programme on Physical and Computational Sciences
since January 2015

Teaching Assistant, Algorithmic Information Dynamics: From Networks to Cells
Santa Fe Institute's Complexity Explorer
since January 2015

Mentor and Project Reviewer, Data Analysis Nanodegree
Udacity
since December 2017

Education

2017 Master's degree in Bioengineering
Universidad Central de Venezuela
thesis: *Clasificación de Tumores Cerebrales en Imagenología de Resonancia Magnética Multimodal con Redes de Autómatas*

2013 Licentiate degree in Computer Science
Universidad Central de Venezuela
thesis: *Segmentación Multicanal de Tumores Cerebrales en Imagenología de Resonancia Magnética con Autómatas Celulares Paralelizados en GPU*

Areas of specialization

Computer Vision • Machine Learning • Complex Adaptive Systems

Publications

Book chapters

2016 *"Dynamics of Tumor Growth: Complexity and Fractality"*
Miguel Martín-Landrove, Antonio Brú, Antonio Rueda-Toicen, and Francisco Torres
in The Fractal Geometry of the Brain, editor: Antonio Di Ieva
Springer Series in Computational Neuroscience

Journal articles

2016 *"A Decomposition Method for Global Evaluation of Shannon Entropy and Local Estimations of Algorithmic Complexity"*
Hector Zenil, Fernando Soler-Toscano, Narsis A. Kiani, Santiago Hernández-Orozco, and Antonio Rueda-Toicen
(submitted to IEEE Transactions of Information Theory)
ArXiv preprint available online

2016 *"Unsupervised Segmentation of Multispectral Images with Cellular Automata "*
Wuilian Torres and Antonio Rueda-Toicen
accepted to the Journal of the Faculty of Engineering, Universidad Central de Venezuela

2015 *"Search of Complex Binary Cellular Automata Using Behavioral Metrics"*
Juan López-González and Antonio Rueda-Toicen
Complex Systems, 24(1)
available online

Conference articles

2016 *"Characterizing the Structure of Complex Protein-Protein Interaction Networks"*
Proceedings of CIMENICS 2016, XIII Congreso Internacional de Métodos Numéricos en Ingeniería y Ciencias Aplicadas
Allan Zea and Antonio Rueda-Toicen
available online

2016 *"Clasificación de Imágenes Multiespectrales Utilizando Autómatas Celulares"*
Proceedings of the SELPER 2016, XVII International Symposium on Remote Sensing and Geographical Information Systems
Wuilian Torres, Wladimir Barrios, and Antonio Rueda-Toicen
available online

2016 *"Segmentation of Dynamic Contrast-Enhanced Magnetic Resonance Images of the Prostate"*
Proceedings of CIMENICS 2016, XIII Congreso Internacional de Métodos Numéricos en Ingeniería y Ciencias Aplicadas
Wuilian Torres, Leonardo Cordero, Miguel Martín-Landrove, and Antonio Rueda-Toicen
available online

2014 *"Evolution Rules of Deterministic Cellular Automata for Multichannel Segmentation of Brain Tumors in MRI"*
Proceedings of CIMENICS 2014, XII Congreso Internacional de Métodos Numéricos en Ingeniería y Ciencias Aplicadas
Antonio Rueda-Toicen, Rhadamés Carmona, Miguel Martín-Landrove, and Wuilian Torres
available online

2014 *"Unsupervised Segmentation of Multispectral Images with Cellular Automata"*
Proceedings of CIMENICS 2014, XII Congreso Internacional de Métodos Numéricos en Ingeniería y Ciencias Aplicadas
Antonio Rueda-Toicen and Wuilian Torres
available online

2014 *"Autómatas Celulares para la Segmentación y Clasificación de Imágenes Multiespectrales"*
Proceedings of V Jornadas Nacionales de Geomática y IX Jornadas de Educación en Percepción Remota en el Ámbito de Mercosur
Antonio Rueda-Toicen and Wuilian Torres
available online

Other education

2014 Wolfram Science Summer School 2014
Project: Estimation of the fractal dimension of brain tumors.

Work experience

2013-2014 *Lead software developer*
Yttrium Technology LLC

2009-2013 *Java trainer and consultant*
Centege CA

2002-2013 *Translator & technical writer*
Translass AC

2010 *Web developer*
Softrain CA

Languages

Human-to-human

- Fluent, native level English
- Fluent, native level Spanish

Human-to-computer

I've developed commercial software using the following programming languages:

- Python
- R
- SQL
- Java
- Mathematica
- C
- C++
- C#
- CUDA
- Matlab
- Javascript
- HTML + CSS

I'm also proficient in document typesetting with LaTeX.

IT professional certifications

2016 Data Science Specialization, Johns Hopkins University, via Coursera
2009 Sun Certified Java Programmer, Sun Microsystems
2002 Microsoft Certified Systems Engineer, Microsoft
2002 Microsoft Certified Systems Administrator, Microsoft

Projects

Segmentation of Brain Tumors in Multichannel MRI with GPU-accelerated Cellular Automata
Fast image segmentation method for radiosurgical planning.
Code available @ GitHub

Online Algorithmic Complexity Calculator
The Online Algorithmic Complexity Calculator is an ongoing long term project of the Algorithmic Nature Group implementing semi-computable measures of algorithmic complexity.
Live app at: www.complexitycalculator.com
Code available @ GitHub

Cellular Automata Discoverer
Java application that uses genetic search to find complex cellular automata with behavioral metrics similar to Conway's Game of Life in a non-totalistic Moore neighborhood.
Available from www.cellular-automata.com/discoverer/

References

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Miguel Martín-Landrove
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