

Antonio Rueda Toicen

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Current positions

Instructor

[Instituto Nacional de Bioingeniería, Universidad Central de Venezuela](#)

since April 2017

Operational and Production Manager

[ItBit Programme on Physical and Computational Sciences](#)

since January 2015

Teaching Assistant, Information Dynamics of Complex Networks

[Santa Fe Institute's Complexity Explorer](#)

since January 2015

Researcher

[Algorithmic Nature Group, LABORES for the Natural and Digital Sciences](#)

since January 2015

[Physics and Mathematics in Biomedicine Consortium](#)

since October 2012

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/](http://www.cellular-automata.com/discoverer/)

References

Héctor Zenil

Head of the ItBit Programme on Physical and Computational Sciences

OXFORD UNIVERSITY & KAROLINSKA INSTITUTET

hector.zenil@cs.ox.ac.uk

Miguel Martín-Landrove

Director of Physics and Mathematics in Biomedicine Consortium

UNIVERSIDAD CENTRAL DE VENEZUELA

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Gabrielle Beans

Program Manager of Online Education

SANTA FE INSTITUTE

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