

Marcelino **Rodríguez Cancio**

SOFTWARE ENGINEER

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“The only unbreakable ‘NO’ is the one you give to yourself”

Skills

Areas of Expertise	Software engineering, Digital Signal Processing, Automated Testing, Data Structures and Algorithms
Programming Languages	C++, C, Python, Java, C#, Object Pascal, JavaScript, TCL
Programming tools	INRIA-Spoon, Soot, VTK, ITK, Boost, .NET, DirectX
Languages	Spanish (Native), English and French (Fluent)

Experience

INRIA (Institut National de Recherche en Informatique et en Automatique)

RENNES, France

RESEARCH ENGINEER

2014 - PRESENT

- Research and Implement over the Java Virtual Machine optimizations for approximated computing
- Build tools for automated microbenchmarking
- Implement a framework to obtain advanced unit test coverage metrics
- Develop software for code transformation / generation

CIMNE (International Center for Numerical Method in Engineering)

BARCELONA, Spain / S. CLARA, Cuba

RESEARCH ENGINEER

2010 - 2014

- Research and implement methods in digital signal processing (medical imaging, industrial microscopy, audio processing)
- Build software products for the medical and industrial sector featuring our signal processing methods
- Develop a framework for the rapid prototyping and development of signal processing software tailored to specific customer's needs
- Led development teams

Transparent Blue

BOGOTÁ, Colombia

CTO

2008 - 2010

- Develop software for the hydraulic engineering field
- Implement optimization algorithms to calibrate engineering models
- Founder of this start-up in 2008. The company reached 1,1 Million turnover in 2015
- Recruit and assemble the development team (6 persons)
- Led development effort

Education

Ph.D. in Computer Science (current)

RENNES, France

UNIVERSITÉ RENNES 1

Mar. 2015 - PRESENT

- Research in Approximated Computing
- Scholarship for the Doctoral EIT Digital School of Business.

Ms.C. in Electrical Engineering

Sta. CLARA, Cuba

UNIVERSIDAD CENTRAL DE LAS VILLAS

2012 - 2014

- Mention in Digital Signal Processing
- Graduated with honors

B.S. in Computer Science

Sta. CLARA, Cuba

UNIVERSIDAD CENTRAL DE LAS VILLAS

2003 - 2008

Publications

PAPERS

- 2016 **Automatic Microbenchmark Generation to Prevent Dead Code Elimination and Constant Folding**, Marcelino Rodríguez-Cancio, Benoit Baudry, Benoit Combemale. *(Submitted to ASE)* Singapur
- 2015 **Automatic Software Diversity in the Light of Test Suites**, Benoit Baudry, Simon Allier, Marcelino Rodríguez-Cancio, Martin Monperrus. *CoRR abs/1509.00144* Rennes
- 2015 **DSpot: Test Amplification for Automatic Assessment of Computational Diversity**, Benoit Baudry, Simon Allier, Marcelino Rodríguez-Cancio, Martin Monperrus. *CoRR abs/1503.05807* Rennes
- 2015 **Estimation of Wall Shear Stress using 4D flow Cardiovascular MRI and Computational Fluid Mechanics**, E.Soudah, J.Casacuberta, JS.Perez, PJ.Gamez-Montero, M.Rodríguez-Cancio, G.Raush, CH.Li, F.Carrerasc, R.Castilla.*Submitted to Journal of mechanics in medicine and biology(in review)* Barcelona
- 2013 **Inclusive design of a Discrete Element Method's platform**, Roberto Roselló, Imsay Sanchez, Deníz, Marcelino Rodríguez-Cancio , C. A. Recarey Morfa. *X International symposium on Structures, Geotechnic and Materials* Cayo Sta. María, Cuba
- 2013 **Functions for tissue differentiation in PC-MRI images**, Marcelino Rodríguez-Cancio , C. A. Recarey Morfa. *X International symposium on Structures, Geotechnic and Materials* Cayo Sta. María, Cuba
- 2013 **Carbon steel characterization using digital processing of metallographic images**, M. A. Castro-Fuentes, Marcelino Rodríguez-Cancio , C. A. Recarey Morfa. *X International symposium on Structures, Geotechnic and Materials* Cayo Sta. María, Cuba
- 2013 **Segmentation and estimation of cerebrospinal fluid volume using MRI images**, Enrique González-Martín, Marcelino Rodríguez-Cancio , C. A. Recarey Morfa. *X International symposium on Structures, Geotechnic and Materials* Cayo Sta. María, Cuba
- 2013 **Aorta centerline extraction in 4D PC-MRI images**, Denis Deníz, Marcelino Rodríguez-Cancio , C. A. Recarey Morfa. *X International symposium on Structures, Geotechnic and Materials* Cayo Sta. María, Cuba
- 2011 **Solutions for the practical implementation of an aorta segmentation algorithm.** , Marcelino Rodríguez-Cancio , I. Pérez Morales, H. Yervilla Herrera, R. Roselló Valera, A. Taboada-Crispi, C. A. Recarey Morfa *V Latin American Congress on Biomedical Engineering CLAIB* Ciudad Habana

BLOG POST

- 2012 **WatDis, the Little Challenger**, Marcelino Rodríguez-Cancio. Bogotá
<http://www.water-simulation.com/wsp/2012/11/19/watdis-the-little-challenger/>

Projects

AutoJMH (Automatic generator of microbenchmarks)

France

RESEARCH ENGINEER — [HTTPS://GITHUB.COM/AUTOJMH/AUTOJMH-SOURCE-CODE](https://github.com/AutoJMH/AutoJMH-source-code)

2015 - 2016

- Properly understand the problem of performance microbenchmarking
- Research and implement code generation / modification methods to generate microbenchmarks.
- Implement data-flow and control-flow analyses to refine the generated code in order to avoid unwanted optimizations by the JVM that would otherwise distort the measurements.

Diversity ToolKit (Automatic software diversification)

France

RESEARCH ENGINEER — [HTTP://DIVERSIFY-PROJECT.GITHUB.IO/DIVERSIFICATION-TOOLBOX.HTML](http://diversify-project.github.io/diversification-toolbox.html)

2014 - 2016

- Implement methods for the automatic diversification of software

Syringe (Source code instrumentation framework for Java)

France

RESEARCH ENGINEER — [HTTP://DIVERSIFY-PROJECT.GITHUB.IO/DIVERSIFICATION-TOOLBOX.HTML](http://diversify-project.github.io/diversification-toolbox.html)

2014 - 2016

- Design the source code instrumentation framework for ease of use.
- Explore the potential of code instrumentation to obtain advanced test coverage metrics

Controller Genius (3D Max Rigging tool)

France

DEVELOPER — [HTTP://CONTROLLERGENIUS.COM/](http://controllergenius.com/)

2015

- Develop the GUI and automation scripts for rigging mechanisms

Unbundling (Dependency optimization tool)

France

RESEARCH ENGINEER — [HTTPS://GITHUB.COM/BOSCOFILHO/UNBUNDLING](https://github.com/BOSCOFILHO/UNBUNDLING)

2015

- Develop the dependency optimization algorithm
- Build and implement the tool

TestEye (IntelliJ IDEA plugin to analyze extended coverage information)

France

RESEARCH ENGINEER — [HTTPS://GITHUB.COM/DIVERSIFY-PROJECT/IDEA-PLUGIN](https://github.com/DIVERSIFY-PROJECT/IDEA-PLUGIN)

2014-2015

- Develop the plugin
- Build extended coverage report

Junco (JUnit + COverage. Tool to identify the individual coverage of a test case)

France

RESEARCH ENGINEER — [HTTPS://GITHUB.COM/MARCELINORC/JUNCO-PROVIDER](https://github.com/MARCELINORC/JUNCO-PROVIDER)

2010 - 2014

- Develop the tool, aiming at ease of use.
- Implement the coverage analysis separating the coverage of each individual test case

DiPPo (Signal Processing Framework)

Spain

DEVELOPER — [HTTP://WWW.CIMNE.COM/VPAGE/2/0/TECHNOLOGY/PRODUCTS](http://www.cimne.com/vpage/2/0/TECHNOLOGY/PRODUCTS)

2010 - 2014

- Design and develop the platform
- Implement Model Driven Engineering methods for prototype code generation.
- Design memory management schemes for large quantities of data

Aorta 4D (Medical imaging tool)

Spain / Cuba

RESEARCH ENGINEER — [HTTP://WWW.CIMNETECNOLOGIA.COM/PRODUCTS.ASPX?ID=2&PRODUCT=20](http://www.cimnetecnologia.com/products.aspx?id=2&product=20)

2010 - 2014

- Research and implement algorithms for the segmentation of the human aorta
- Implement visualization and quantification tools for the blood flow.
- Develop a software product featuring these results to meet customers needs

Medula (Medical imaging tool)

Cuba

RESEARCH ENGINEER — [HTTP://WWW.CIMNETECNOLOGIA.COM/PRODUCTS.ASPX?ID=2&PRODUCT=20](http://www.cimnetecnologia.com/products.aspx?id=2&product=20)

2012 - 2013

- Supervise the project
- Research and implement algorithms to estimate the amount of anesthesia needed for a given local surgery by quantifying the spinal liquid fluid using medical images

AceroPro (Metallurgical digital microscopy analysis tool)

Cuba

RESEARCH ENGINEER — [HTTP://WWW.CIMNETECNOLOGIA.COM/PRODUCTS.ASPX?ID=2&PRODUCT=20](http://www.cimnetecnologia.com/products.aspx?id=2&product=20)

2012 - 2013

- Supervise the project
- Research and implement algorithms to evaluate carbon level in steel by means of image processing

Transparent Blue WatDis PC (Water distribution system)

Colombia

LEAD DEVELOPER — [HTTP://WWW.WATDIS.COM](http://www.watdis.com)

2008 - 2013

- Organize and coordinate development efforts
- WatDis OOP design and concept.
- Desing and implement the graphical user interface (GUI), and visualization tools for the behavior of hydraulics models for Windows.
- Implement optimization algorithms to calibrate engineering models.
- Develop prototypes to extend existing products from Newtonian (water) to non Newtonian fluids (oil)

Transparent Blue WatDis Android (Water distribution system)

Colombia

LEAD DEVELOPER — [HTTP://WWW.WATDIS.COM](http://www.watdis.com)

20011 - 2012

- Organize and coordinate development efforts
- Desing and implement the graphical user interface (GUI) for Android and visualization tools for the behavior of hydraulics models.

EduMedia (Model Driven code generator)

STA. CLARA, Cuba

DEVELOPER

2007 - 2008

- Develop the code generator for the automatic generation of Flash Q & A applications to serve as introduction to IT for children in primary school.

Teaching experience

IT University of Ciego de Ávila

CIEGO DE ÁVILA, Cuba

TEACHING STAFF

2008

- Courses in Logic, Unit Testing

Universidad Central de Las Villas (Faculty of Mathematics, Physics and Computer Science)

STA. CLARA, Cuba

TEACHING STAFF

2008, 2010

- Courses in IT, Unit Testing
- Thesis Supervisor for: "Computational Tool for Segmentation of Brain Tumors in Magnetic Resonance Imaging". Student: Alvaro Javier Fuentes
- Thesis Supervisor for: "Detection of cerebrospinal fluid from MRI images". Student: Enrique González Martín
- Thesis Supervisor for: "Software for carbon steels characterization with metallographic images". Student: Manuel A. Castro Fuentes
- Thesis Supervisor for: "Segmentation of the aorta from Cardiovascular Magnetic Resonance Images 4D". Student: Denis Deniz González