

Part A. PERSONAL INFORMATION		CV date	10/09/2021
First and Family name	Juan Antonio Clemente Barreira		
Social Security, Passport, ID number	52887871S	Age	36
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0002-7855-1051	
	SCOPUS Author ID (*)	25228491800	
	WoS Researcher ID (*)		

(*) *Optional*

(**) *Mandatory*

A.1. Current position

Name of University/Institution	Universidad Complutense de Madrid		
Department	Departamento de Arquitectura de Computadores y Automática / Facultad de Informática		
Address and Country	C/ Profesor José García Santesmases 9, 28040 Madrid		
Phone number	913947600	E-mail	ja.clemente@fdi.ucm.es
Current position	Profesor Titular de Universidad	From	26/07/2021
Key words	Computer architecture, Technology, Reconfigurable hardware, Reliability, Single Event Effects (SEEs)		

A.2. Education

PhD, Licensed, Graduate	University	Year
MSc Degree in Computer Science	Universidad Complutense de Madrid	2007
PhD Degree	Universidad Complutense de Madrid	2011

A.3. General indicators of quality of scientific production (see instructions)

28 papers in scientific journals indexed in the JCR and 23 publications in international conferences. 2 "sexenios de investigación", spanning in the periods: 2009-2014 and 2015-2020.

426 citations of my publications, h index 13 (Google Scholar)

Part B. CV SUMMARY (max. 3500 characters, including spaces)

I work as a Associate Professor (profesor Titular de Universidad) since July 2021 in Universidad Complutense de Madrid (UCM) in the area "Área de Arquitectura y Tecnología de Computadores". Since I started my PhD research at UCM in 2007, my research focused on optimization of digital design and efficient management of dynamically reconfigurable hardware. Then, since my PhD defense, I have focused my research in fault injection in reconfigurable devices and Single Event Effect (SEE) assessment of devices against natural radiation.

I have participated in 8 competitive research projects, and since September 2021, I currently lead as "Investigador Principal" a I+D+I project granted by the "Ministerio de Ciencia e Innovación (MICINN)". During this time, I have been coauthor of 23 publications in international conferences and 28 scientific journals indexed in the JCR.

I collaborate with the following institutions: *Centro Nacional de Aceleradores (CNA)*, *Institut Polytechnique de Grenoble (INPG)* and *Office National d'Etudes et de Recherches Aéronautiques (ONERA)*.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

Coauthor of 28 scientific journals indexed in the JCR:

- 1 J. Resano, **J. A. Clemente**, C. González, D. Mozos and F. Catthoor, "Efficiently



- Scheduling Run-Time Reconfigurations”, in *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, Vol.13, pp. 1–12, 2008.
- 2 **J. A. Clemente**, C. González, J. Resano and D. Mozos, “A Task Graph Execution Manager for Reconfigurable Systems”, in *Microprocessors and Microsystems: Embedded Hardware Design (MICPRO)*, Vol. 34, Issues 2-4 pp. 73–83, 2010.
 - 3 **J. A. Clemente**, J. Resano, C. González and D. Mozos, “A Hardware Implementation of a Run-Time Scheduler for Reconfigurable Systems”, in *IEEE Transactions on Very Large-Scale Integration Systems (TVLSI)*, Vol. 19, Issue 7, pp. 1263–1276, 2011.
 - 4 **J. A. Clemente**, I. Beretta, V. Rana, D. Atienza and D. Sciuto, “A Mapping-Scheduling Algorithm for Hardware Acceleration on Reconfigurable Platforms”, in *ACM Transactions on Reconfigurable Technology and Systems (TRETs)*, Vol. 7, Issue 2, pp. 1–27, 2014.
 - 5 **J. A. Clemente**, J. Resano and D. Mozos, “An Approach to Manage Reconfigurations and Reduce Area Cost in Hard Real-Time Reconfigurable Systems”, in *ACM Transactions on Embedded Computing Systems (TECS)*, Vol. 13, Issue 14, pp. 1–24, 2014.
 - 6 R. Velazco, **J. A. Clemente**, G. Hubert, W. Mansour, C. Palomar, F. J. Franco, M. Baylac, S. Rey, O. Rosetto and F. Villa, “Evidence of the Robustness of a COTS Soft-Error Free SRAM to Neutron Radiation”, in *IEEE Transactions on Nuclear Science (TNS)*, Vol. 61, Issue 6, pp. 3103–3108, December 2014.
 - 7 **J. A. Clemente**, E. Pérez-Ramo, J. Resano, D. Mozos and F. Catthoor, “Configuration Mapping Algorithms to Reduce Energy and Time Reconfiguration Overheads in Reconfigurable Systems”, in *IEEE Transactions on Very Large-Scale Integration Systems (TVLSI)*, Vol. 22, Issue 6, pp. 1248–1261, 2014.
 - 8 F. Serrano, **J. A. Clemente** and H. Mecha, “A Methodology to Emulate Single Event Upsets in Flip-Flops using FPGAs through Partial Reconfiguration and Instrumentation”, in *IEEE Transactions on Nuclear Science (TNS)*, Vol. 62, Issue 4, pp. 1617–1624, 2015.
 - 9 **J. A. Clemente**, R. Gran, A. Chocano, C. del Prado and J. Resano “Hardware Architectural Support for Caching Partitioned Reconfigurations in Reconfigurable Systems”, in *IEEE Transactions on Very Large-Scale Integration Systems (TVLSI)*, Vol. 24, Issue 2, pp. 530–543, 2016.
 - 10 **J. A. Clemente**, W. Mansour, R. Ayoubi, F. Serrano, H. Mecha, H. Ziade, W. El Falou and R. Velazco, “Hardware Implementation of a Fault-tolerant Hopfield Neural Network”, in *Neurocomputing*, Vol. 171, pp. 1606–1609, 2016.
 - 11 **J. A. Clemente**, F. J. Franco, F. Villa, M. Baylac, S. Rey, H. Mecha, J. A. Agapito, H. Puchner, G. Hubert and R. Velazco, “Statistical Anomalies of Bitflips in SRAMs to Discriminate SBUs from MCUs”, in *IEEE Transactions on Nuclear Science (TNS)*, Vol. 63, pp. 2087–2094, 2016.
 - 12 P. Ramos, V. Vargas, M. Baylac, F. Villa, S. Rey, **J. A. Clemente**, N.-E. Zergainoh, J.-F. Méhaut and R. Velazco, “Evaluating the SEE Sensitivity of a 45 nm SOI Multi-core Processor due to 14 MeV Neutrons”, in *IEEE Transactions on Nuclear Science (TNS)*, Vol. 63, pp. 2193–2200, 2016.
 - 13 **J. A. Clemente**, F. J. Franco, F. Villa, M. Baylac, P. Ramos, V. Vargas, H. Mecha, J. A. Agapito and R. Velazco, “Single Events in a COTS Soft-Error Free SRAM at Low Bias Voltage Induced by 15-MeV Neutrons”, in *IEEE Transactions on Nuclear Science (TNS)*, Vol. 63, pp. 2072–2079, 2016.
 - 14 R. Ramezani, Y. Sedaghat, M. Naghibzadeh and **J. A. Clemente**, “Reliability and Makespan Optimization of Hardware Task Graphs in Partially Reconfigurable Platforms”, in *IEEE Transactions on Aerospace and Electronic Systems (TAES)*, Vol. 53, pp. 983–994, 2017.
 - 15 R. Ramezani, Y. Sedaghat and **J. A. Clemente**, “Reliability Improvement of Hardware Task Graphs via Configuration Early Fetch”, in *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, Vol. 25, pp. 1408–1420, 2017.
 - 16 **J. A. Clemente**, G. Hubert, F. J. Franco, F. Villa, M. Baylac, H. Mecha, H. Puchner and R. Velazco, “Sensitivity Characterization of a COTS 90-nm SRAM at Ultra Low Bias Voltage”, in *IEEE Transactions on Nuclear Science (TNS)*, Vol. 64, pp. 2188–2195, 2017.
 - 17 F. J. Franco, **J. A. Clemente**, M. Baylac, S. Rey, F. Villa, H. Mecha, J. A. Agapito, H.



- Puchner, G. Hubert and R. Velazco, "Statistical Deviations from the Theoretical only-SBU Model to Estimate MCU rates in SRAMs", in IEEE Transactions on Nuclear Science (TNS), Vol. 64, pp. 2152–2160, 2017.
- 18 J. Olivito, F. Serrano, **J. A. Clemente**, H. Mecha and J. Resano, "Analysis of the Reconfiguration Latency and Energy Overheads for a Xilinx Virtex-5 FPGA", in IET Computers & Digital Techniques, Vol. 12, pp. 150-157, 2018.
 - 19 **J. A. Clemente**, G. Hubert, J. A. Fraire, F. J. Franco, F. Villa, S. Rey, M. Baylac, H. Puchner, H. Mecha, and R. Velazco, "SEU Characterization of Three Successive Generations of COTS SRAMs at Ultralow Bias Voltage to 14.2 MeV Neutrons", in IEEE Transactions on Nuclear Science (TNS), Vol. 65, pp. 1858–1865, 2018.
 - 20 R. Ramezani, Y. Sedaghat, M. Naghibzadeh and **J. A. Clemente** "A Decomposition-based Reliability and Makespan Optimization Technique for Hardware Task Graphs", in Reliability Engineering & System Safety (RESS), Vol. 180, pp. 13-24, 2018.
 - 21 Francisco J. Franco, **J. A. Clemente**, H. Mecha and R. Velazco, "Influence of Randoness during the Interpretation of Results from Single-Event Experiments on SRAMs", in IEEE Transactions on Device and Materials Reliability (TDMR), Vol. 19, pp. 104-111, 2019.
 - 22 G. Hubert, S. Aubry and **J. A. Clemente**, "Impact of Ground Level Enhancement (GLE) Solar Events on Soft Error Rate for avionics", in IEEE Transactions on Aerospace and Electronic Systems (TAES), Vol. 56, pp. 3674-3684, 2020.
 - 23 J. C. Fabero, H. Mecha, F. J. Franco, **J. A. Clemente**, G. Korkian, S. Rey, B. Cheymol, M. Baylac, G. Hubert, and R. Velazco, "Single Event Upsets under 14-MeV Neutrons in a 28-nm SRAM-based FPGA in Static Mode", in IEEE Transactions on Nuclear Science (TNS), Vol. 67, pp. 1461-1469, 2020.
 - 24 F. J. Franco, **J. A. Clemente**, G. Korkian, J. C. Fabero, H. Mecha, and R. Velazco, "Inherent Uncertainty in the Determination of Multiple Event Cross Sections in Radiation Tests", in IEEE Transactions on Nuclear Science (TNS), Vol. 67, pp. 1547-1554, 2020.
 - 25 R. Ramezani, **J. A. Clemente** and F. J. Franco, "Analytical Reliability Estimation of SRAM-based FPGA Designs against Single-bit and Multiple-cell Upsets", in Reliability Engineering & System Safety (RESS), Vol. 202, Article no. 107036, 2020.
 - 26 M. Rezaei, P. Martín-Holgado, Y. Morilla, F. J. Franco, J. C. Fabero, H. Mecha, H. Puchner, G. Hubert, and **J. A. Clemente**, "Evaluation of a COTS 65-nm SRAM under 15 MeV Protons and 14 MeV Neutrons at Low VDD", in IEEE Transactions on Nuclear Science (TNS), Vol 67, pp. 2188-2195, 2020.
 - 27 G. Korkian, J. C. Fabero, G. Hubert, M. Rezaei, H. Mecha, F. J. Franco, H. Puchner and **J. A. Clemente**, "Experimental and Analytical Study of the Responses of Nanoscale Devices to Particles Impinging at Various Incident Angles", in IEEE Transactions on Nuclear Science (TNS), Vol 67, pp. 2345-2352, 2020.
 - 28 **J. A. Clemente**, G. Hubert, M. Rezaei, F. J. Franco and H. Mecha, "Impact of the Bitcell Topology on the Multiple Cell Upsets Observed in VLSI Nanoscale SRAMs", in IEEE Transactions on Nuclear Science (TNS), (in press), 2021.

C.2. Research projects (participation at full time)

1- Project reference: PID2020-112916GB-I00

Title: Estudio de los efectos de la radiación y procesamiento eficiente de imágenes hiperspectrales para nuevo espacio

Main researchers: Juan Antonio Clemente Barreira y Carlos González Calvo

Funding entity: Ministerio de Ciencia e Innovación (MICINN)

Duration: 01/09/2021 – 31/08/2024, amount of the grant (€): 173.635

Type of participation: Main researcher

2- Project reference: TIN2017-87237-P

Title: Técnicas hardware y software para el análisis, detección y recuperación de errores inducidos por la radiación en sistemas digitales embarcados en misiones espaciales II

Main researcher: Hortensia Mecha López (Universidad Complutense de Madrid)

Funding entity: Ministerio de Economía y Competitividad

Duration: 01/01/2017 - 31/12/2020, amount of the grant (€): 118.338



Type of participation: Research team

3- Project reference: TIN2013-40969-P

Title: Técnicas hardware y software para el análisis, detección y recuperación de errores inducidos por la radiación en sistemas digitales embarcados en misiones espaciales

Main researchers: Hortensia Mecha López y M^a Carmen Molina Prego (Universidad Complutense de Madrid)

Funding entity: Ministerio de Economía y Competitividad

Duration: 01/01/2014 - 31/12/2016, amount of the grant (€): 102.729

Type of participation: Work team

4- Project reference: AYA2009-13300-C03-02

Title: Estudio del efecto de la radiación en FPGAs para aplicaciones espaciales complejas

Main researcher: Hortensia Mecha López

Funding entity: Ministerio de Economía y Competitividad

Duration: 01/01/2010 - 31/12/2013, amount of the grant (€): 30.000

Type of participation: Research team

5- Project reference: TIN2009-09806

Title: Consideraciones avanzadas para la implementación realista y eficiente de multitarea hardware sobre FPGAs

Main researcher: Daniel Mozos Muñoz (Universidad Complutense de Madrid)

Funding entity: Ministerio de Ciencia e Innovación

Duration: 01/01/2010 – 31/12/2012, amount of the grant (€): 73.300

Type of participation: Work team

6- Project reference: TIN2006-03274

Title: Multitarea Hardware sobre Arquitecturas con FPGAs de 1,2 y 3 dimensiones. Técnicas de planificación y colocación de tareas y estrategias de defragmentación.

Main researcher: Daniel Mozos Muñoz (Universidad Complutense de Madrid)

Funding entity: Ministerio de Ciencia e Innovación

Duration: 01/10/2006 - 30/09/2009, amount of the grant (€): 63.100

Type of participation: Work team

7- Project reference: PR34/07-15821

Title: Desarrollo de un gestor de reconfiguraciones para HW dinámicamente reconfigurable

Investigador principal: Jesús Javier Resano Ezcaray (Universidad Complutense de Madrid)

Funding entity: Universidad Complutense de Madrid

Duration: 01/01/2008 – 31/12/2009, amount of the grant (€): 8.400

Type of participation: Work team

8- Project reference: SNCF/127282

Title: Dynamically Adaptive Architectures with Reconfigurable Logic for Nomadic Embedded Systems

Main researcher: David Atienza Alonso (École Polytechnique Fédérale de Lausanne)

Funding entity: Swiss National Science Foundation (SNSF)

Duration: 01/03/2010 – 30/06/2013, amount of the grant (€): 277.021

Type of participation: Work team

C.5. Supervised doctoral thesis

1. Student: **Reza Ramezani**: "*Reliability and Makespan Improvement of Hardware Task Graphs in Reconfigurable Platforms*". Advisors: Y. Sedaghat, M. Naghibzadeh, J. A. Clemente. Ferdowsi University of Mashhad, Iran, 2017.
2. Student: **Felipe Serrano Santos**: "*Emulación basada en FPGA de los efectos de los single event upsets ocasionados por la radiación en circuitos digitales tolerantes a fallos*". Advisors: H. Mecha, J.A. Clemente, UCM, 2017.



C.6. Research internships

2 internships in the École Polytechnique Fédérale de Lausanne (Lausanne, Switzerland):

* From 01/10/2009 until 28/02/2010 (5 months).

* From 01/07/2010 until el 31/08/2010 (2 months).

3 internships in the Institut National Polytechnique de Grenoble (Grenoble, France):

* From 01/08/2013 until 31/10/2013 (3 months).

* From 01/04/2015 until 30/06/2015 (3 months).

* From 01/04/2017 until 30/06/2017 (3 months).

1 internship in the ONERA research center (Toulouse, France):

* From 01/03/2013 until 31/08/2019 (6 months).