

Part A. PERSONAL DATA

Date of the CVA	5 Sept 2018
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Name	Julián PROENZA ARENAS		
Spanish ID number	43.042.705E	Age	52
Research identification numbers	Researcher ID	B-7602-2014	
	Orcid Code	0000-0001-7238-0557	

A.1. Current professional status

Institution	University of the Balearic Islands		
Department	Department of Mathematical Sciences and Informatics		
Address	Campus UIB. Carretera de Valldemossa km. 7,5. 07122 Palma de Mallorca		
Telephone	+34 971172992	Email address	julian.proenza@uib.es
Position	Associate Professor	Start date	12/Nov/2009
Key Words for his research activity	Dependable Systems, Fault Tolerance, Distributed Embedded Systems, Real-Time Systems, Adaptive Systems, Communications for Automation, Field buses, Industrial Ethernet, FTT paradigm, TSN		

A.2. Education

Degree	University	Year
<i>Licenciatura</i> in Physics (5-year bachelor degree)	University of the Balearic Islands	1989
PhD in Informatics (with European Doctor mention)	University of the Balearic Islands	2007

A.3. General indicators of the scientific production quality

Number of granted periods for research merit (Spanish sexenios): 2 (last one in 2015)

Number of PhD theses supervised in the last 10 years: 3 (and 3 more in progress)

Total number of citations:

- 157 (according to the Web of Science which only includes 42 of the 90 papers published)
- 808 (Google Scholar <https://scholar.google.es/citations?user=m5Ku--AAAAAJ&hl=es>)

Average of citations per year for the last 5 years (without the current year):

- 18,6 (according to the Web of Science which only includes 42 of the 90 papers published)
- 70,8 (Google Scholar <https://scholar.google.es/citations?user=m5Ku--AAAAAJ&hl=es>)

Total number of papers published in first-quartile journals: 9

H-index:

- 6 (according to the Web of Science which only includes 42 of the 90 papers published)
- 14 (Google Scholar <https://scholar.google.es/citations?user=m5Ku--AAAAAJ&hl=es>)

Part B. CURRICULUM SUMMARY

Julián Proenza received the 'Licenciatura' degree in Physics from the University of the Balearic Islands (UIB), Palma de Mallorca, Spain, in 1989, and a Ph.D. in Informatics from the same university in 2007. He is currently an Associate Professor in the Dept. of Mathematics and Informatics at the UIB, teaching both at the undergraduate and postgraduate levels. During his years as a lecturer he had additional academic responsibilities such as Secretary of the Faculty of Informatics, member of the Quality Supervision Boards of the degree in Informatics and the Master in Electronics Engineering,

and Student Mobility Coordinator for the degree in Informatics. He is currently Secretary of the UIB's Polytechnical School and member of the Quality Supervision Board of the Master in Computing Engineering. Moreover, he has been the academic coordinator of UIB in the Erasmus Mundus Projects 'EUROWEB' and 'EUROWEB +', facilitating scholarships for students on undergraduate, master, doctoral and post-doctoral level, as well as for university staff in academic or administrative positions, financed by the European Commission.

Dr. Proenza's research interests include Dependable and Real-Time Systems, Fault-Tolerant Distributed Systems, Adaptive Systems, Clock Synchronization, and Fieldbus and Industrial Networks. He is co-author of more than 90 publications in international scientific conferences and journals, and co-author of 3 patents. Papers co-authored by him received the best paper award at the IEEE Workshop on Factory Communication Systems (WFCS) 2004; and the best work-in-progress paper award at the IEEE Conference on Emerging Technologies and Factory Automation (ETFA 2012), at WFCS 2014 and at WFCS 2016. He has supervised three PhD theses and is currently supervising three more. He has been involved in several national research projects, in some cases as a member of the research team and in others as main responsible for the project. He was a visiting researcher at Mälardalen University (MDH) in 2008, at Universidade do Porto in 2010 and 2012, and at Teesside University in 2012.

He has acted as Guest Editor for two Special Sections on Industrial Communication Systems of the IEEE Transactions on Industrial Informatics in 2010 and 2016. He has served as General Co-Chairman for the 2015 edition of the IEEE WFCS. He served as Program Co-Chairman for the 2010 edition and as WiP Co-Chairman for the 2016 edition of the IEEE WFCS. He has acted as Co-Chairman for the Track on Industrial Communication Systems for the 2008, 2009, 2010 and 2014 editions of the IEEE ETFA Conference. He served as General Co-Chair for the 2015 edition of IEEE WFCS. He has co-organized several editions and more recently joined the steering committee of the Workshop on Adaptive and Reconfigurable Embedded Systems (APRES). He has co-organized a Special Session on *Fault Tolerance Techniques in Distributed Embedded and Automation Systems* in the ETFA conference in 2012, 2014 and 2015. He has also served as member of the Program Committee of several international conferences, including the International Workshop on Real-Time Networks (RTN), the International Workshop on Dependable Embedded Systems (WDES), ETFA and WFCS. He has acted as a technical reviewer for several conferences, journals and the Spanish ANEP. He is a member of the Institute of Electrical and Electronic Engineers (IEEE) (elevated to Senior Member in 2013). Within IEEE, he is one of the Co-Chairmen of the Sub-Committee on Fault-Tolerant and Dependable Systems of the Technical Committee on Factory Automation of the IEEE Industrial Electronics Society.

Dr. Proenza is specialized in the design of fault tolerance mechanisms for distributed real-time embedded systems. This specialization has allowed him and his group to face complex problems in the area. His approach is based on delving deeper into the problems to get the maximum insight of the treated issues. This is reflected in his group's work on the thorough evaluation of star topologies' reliability, which was unchecked and taken for granted by the automation community for a decade. In the medium term he is committed to provide fault tolerance support to adaptive systems for ensuring their reliability. In his service to the community he is also devoted to promote high-quality research by others on fault-tolerant and dependable systems with the organization of conferences and the careful training of PhD students.

Part C. MOST RELEVANT MERITS

C.1. Publications

A complete list of publications can be found at: <http://srv.uib.es/julian-proenza-arenas/>

Barranco, M., Proenza, J., Almeida, L., Quantitative characterization of the reliability of simplex buses and stars to compare their benefits in fieldbuses. In ELSEVIER's Reliability Engineering & System Safety, Vol. 138, June 2015, Pages 163—175. **First Quartile in 2015.**

Gessner, D., Barranco, M. A., Ballesteros, A., Proenza, J.. sfiCAN: a Star-based Physical Fault-Injection Infrastructure for CAN networks. In IEEE Transactions on Vehicular Technology, IEEE, Volume 63, Issue 3, March **2014**, 1335—1349. **First Quartile in the category “TELECOMMUNICATIONS” in 2014**

Gessner, D., Barranco, M. A., Proenza, J.. Design and verification of a media redundancy management driver for a CAN star topology. In IEEE Transactions on Industrial Informatics, IEEE, Volume 9, Issue 1, February **2013**, Pages 237—245. **First Quartile in 2013**

Rodríguez-Navas, G., Proenza, J.. Using Timed Automata for Modeling Distributed Systems with Clocks: Challenges and Solutions. In IEEE Transactions on Software Engineering, IEEE Computer Society, Volume 39, Issue 6, June **2013**, Pages 857—868. **First Quartile in 2013**

Barranco, M. A., Proenza, J., Almeida, L.. Quantitative comparison of the error-containment capabilities of a bus and a star topology in CAN networks. In IEEE Transactions on Industrial Electronics, IEEE, Volume 58, Issue 3, Mars **2011**, Pages 802—813. **First Quartile in 2011**

Proenza, J., Miro-Julia, J., Hansson, H.. Managing redundancy in CAN-based networks supporting N-Version Programming. In Computer Standards and Interfaces, Elsevier, Volume 31, Issue 1, January **2009**, Pages 120—127. **Second Quartile in 2009**

Barranco, M. A., Proenza, J., Almeida, L.. Boosting the Robustness of Controller Area Networks: CANcentrate and ReCANcentrate. In Computer, IEEE, Volume 42, Issue 5, May **2009**, Pages 66—73. **First Quartile in 2009**

Rodríguez-Navas, G., Roca, S., Proenza, J.. Orthogonal, Fault-tolerant and High-precision Clock Synchronization for the Controller Area Network. In IEEE Transactions on Industrial Informatics, IEEE, Volume 4, Issue 2, May **2008**, Pages 92—101. **First Quartile in 2008**

Barranco, M. A., Proenza, J., Rodríguez-Navas, G., Almeida, L.. An Active Star Topology for Improving Fault Confinement in CAN Networks. In IEEE Transactions on Industrial Informatics, IEEE, Volume 2, Issue 2, May **2006**, Pages 78—85. **First Quartile in the category “ENGINEERING, INDUSTRIAL” in 2006**

Ferreira, J., Almeida, L., Alberto, J., Pedreiras, P., Martins, E., Rodríguez-Navas, G., Rigo, J., Proenza, J.. Combining Operational Flexibility and Dependability in FTT-CAN. In IEEE Transactions on Industrial Informatics, IEEE, Volume 2, Issue 2, May **2006**, Pages 95—102. **First Quartile in in the category “ENGINEERING, INDUSTRIAL” in 2006**

C.2. Research Projects (due to space limitations only the 2 most relevant projects are referenced)

Title: DFT4FTT: Tolerancia a Fallos Dinámica para incrementar la adaptabilidad de sistemas empotrados distribuidos altamente fiables basados en Flexible Time-Triggered Ethernet. **Principal Investigator:** Julián Proenza Arenas (University of the Balearic Islands). **Granted amount:** 148.588,00 EUR. **Funding Agency:** Spanish Ministerio de Economía y Competitividad. **Project code:** TEC2015-70313-R. **Duration:** Jan 2016 - Dec 2018.

Title: FT4FTT-Ethernet: Mecanismos de Tolerancia a Fallos para sistemas empotrados distribuidos adaptativos basados en FTT-Ehernet. **Principal Investigator:** Julián Proenza Arenas (University of the Balearic Islands). **Granted amount:** 107.690,00 EUR. **Funding Agency:** Spanish Ministerio de Ciencia e Innovación. **Project code:** DPI2011-22992. **Duration:** January 2012 - December 2015 (extended).

C.3. Patents (listed 2 of 3)

Inventors: Proenza, J., Barranco, M. A., Almeida, L.. **Title:** Red de comunicaciones de protocolo CAN con topología en estrella replicada y procedimiento de acoplamiento de dicha

red. **Owner:** University of the Balearic Islands. **Country of protection:** Spain. **Application Number:** 200502292. **Start of protection:** 2005. **In exploitation:** NO

Inventors: Proenza, J., Rodríguez-Navas, G., Barranco, M. A., Almeida, L.. **Title:** Red de comunicaciones de protocolo CAN con topología en estrella. **Owner:** University of the Balearic Islands. **Country of protection:** Spain. **Application Number:** 200402207. **Start of protection:** 2004. **In exploitation:** NO

C.4. PhD Thesis supervision

Design and Formal Verification of a Fault-tolerant Clock Synchronization Subsystem for the Controller Area Network by Guillermo Rodríguez-Navas González. University of the Balearic Islands. 2010. **Sobresaliente cum laude.**

Improving error containment and reliability of communication subsystems based on Controller Area Network (CAN) by means of adequate star topologies by Manuel Alejandro Barranco González. University of the Balearic Islands. 2010. **Sobresaliente cum laude.**

Adding Fault Tolerance To a Flexible Real-Time Ethernet Network for Embedded Systems by David Gessner. University of the Balearic Islands. 2017. **Cum laude.**

On-going PhD work: (1) about to be defended by Sinisa Derasevic. PhD scholarship granted by the EUROWEB Program (An EU Erasmus Mundus project) <http://www.mrtc.mdh.se/euroweb/>. A list of publications can be found at <http://srv.uib.es/sinisa-derasevic/>. (2) By Alberto Ballesteros <http://srv.uib.es/alberto-ballesteros/> (3) By Inés Álvarez <http://srv.uib.es/ines-alvarez/>

C.5. Participation in evaluation tasks. Summarized in Part B

C.6. International Committee Memberships

Committee: IEEE-IES Technical Committee on Factory Automation. **Period:** 2010 – present. **Type of participation:** Co-Chair of the Subcommittee on 'Fault-Tolerant and Dependable Systems'. **Activities:** provide essential information to those interested in the field of industrial automation and to organize scientific events (e.g. participating in program and organization committees) related to this subject such as ETFA, WFCS and SIES. **Organization:** IEEE Industrial Electronics Society. **Web page:** <http://ies-tcfa.dieei.unict.it/FA10>

C.7. Awards

Award: 'Best Work-in-Progress Paper Award' to the paper 'First Implementation and Test of a Node Replication Scheme on top of the Flexible Time-Triggered Replicated Star for Ethernet' presented at the 12th IEEE International Workshop on Factory Communication Systems (WFCS 2016). **Organization:** IEEE Industrial Electronics Society

Award: 'Best Work-in-Progress Paper Award' to the paper 'A Proposal for Managing the Redundancy Provided by the Flexible Time-Triggered Replicated Star for Ethernet' presented at the 10th IEEE International Workshop on Factory Communication Systems (WFCS 2014). **Organization:** IEEE Industrial Electronics Society

Award: 'Best Work-in-Progress Paper Award in Emerging Technologies' to the paper 'A first qualitative evaluation of star replication schemes for FTT-CAN' presented at the 17th IEEE International Conference on Emerging Technologies and Factory Automation (ETFA 2012). **Organization:** IEEE Industrial Electronics Society

Award: 'Best Paper Award' to the paper 'CANcentrate: An Active Star Topology for CAN Networks' presented at the 5th IEEE International Workshop on Factory Communication Systems (WFCS'04). **Organization:** IEEE Industrial Electronics Society