

Part A. PERSONAL INFORMATION

CV date	14-I-2022
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First and Family name	Miquel Roca Adrover		
Social Security, Passport, ID number	43043395E	Age	55
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0003-4648-5683	
	SCOPUS Author ID (*)	36004476500	
	WoS Researcher ID (*)	L-5961-2017	

(*) Optional

(**) Mandatory

A.1. Current position

Name of University/Institution	University of the Balearic Islands		
Department	Industrial Engineering and Construction Department		
Address and Country	Campus UIB. Edificio Mateu Orfila. Cra Valldemossa km 7.5		
Phone number	971173137	E-mail	miquel.roca@uib.es
Current position	Full Professor	From	16/04/2019
Key words	Integrated Circuits, Testing, Radiation, Neural Networks, Artificial Intelligence,		

A.2. Education

PhD, Licensed, Graduate	University	Year
Licensed in Physics	University of the Balearic Islands	1990
PhD in Physics (Electronics)	University of the Balearic Islands	1994

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

Six-year research periods recognized: 5. (1991-1996, 1997-2002, 2003-2008, 2009-2014, 2015-2020)

Transference periods recognized: 1 (1999-2013)

PhD thesis directed in the last 10 years :2

Six-year knowledge transfer periods recognized: 1

Articles indexed in JCR: 42 (12 in Q1, 12 in Q2, 12 in Q3 and 6 in Q4)

Conference Articles: 173

Patents or utility models: 3 (Spain patents)

From source Google Scholar I have 1230 cites with an h index of 19. In the last 5 years, the cites are summarized in the following table

	2017	2018	2019	2020	2021	Valor medio
Cites	77	43	60	69	78	65,4

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

I started my career in November 1992 in the University of the Balearic Islands, where in 2019 after working as an assistant (1992-1995) and associate professor (1995-2019) I obtained a post of Full Professor in the area of Electronic Technology.

I have been teaching different subjects related with electronics in Physics degree, in industrial electronic engineering degree, telematics engineering degree, Master in physics and Master of industrial engineering. I have been the responsible of industrial electronic engineering degree during 18 years. Actually I am the director of the industrial electronic engineering and building department.

My research activity started in January 1991 when I obtained a grant from the Science Ministry.

From this moment I have been working in the following topics:

- a) Integrated Circuits Testing. I worked in the detection of defects in microelectronic circuits mainly by the development of current testing techniques, including quiescent IDDQ and dynamic (IDDt) as well. The study analyzed the case of digital circuits, but also it was extended to analog blocks and radiofrequency circuits. The works deals with fault modelling, sensor design and experimental verifications. With the evolution and advances of microelectronic technologies where parameter deviation became an important issue, an extension of testing techniques considering these parameter deviations was developed in terms of new testing methodologies as predictive testing, oscillation based testing, autotuning test, ... These works have been validated through 16 articles in international journals (with impact index SCI)
- b) Crosstalk analysis in integrated circuits. The study starts with the development of a model for this effect, following by the study of substrate noise. The analysis is validated through experimental analysis from measurements in integrated circuits designed for this purpose. The effect is analyzed as glitches in the voltage signals, as delay faults and finally as implications in energy consumption. The publication of 8 articles in international journals with SCI and the publication of a book in Kluwer edition (today Elsevier) entitled "Noise Inside Integrated Circuits" coauthored with Dr. F. Moll
- c) Radiation effects in microelectronic circuits and dosimeter circuit design. A modelling and analysis of the radiation effects in integrated circuits has been carried out. The results have achieved the design and experimental characterization of sensor circuits for gamma radiation, focusing in hospital radiotherapy applications. 6 articles in international journals with SCI have been published.
- d) Parameter extraction in semiconductor devices. Device modeling have been developed in this topic. 4 articles in international journals with SCI have been published.
- e) Actually my research is focused in neuromorphic circuits and algorithms for several applications as pattern recognition, time series forecast, ... Hardware implementations, which accelerate the process and also reduce energy consumption have been implemented. 6 articles in international journals with SCI have been published as several communications in specialized conferences.

Summarizing, a total of 42 articles in international journals and 173 conference communications have been developed in the previous items commented.

Part C. RELEVANT MERITS (*sorted by typology*)

C.1. Publications (*see instructions*)

1. Frasser, C. F., de Benito, C., Skibinsky-Gitlin, E. S., Canals, V., Font-Rosselló, J., Roca, M., Ballester, P. J., & Rosselló, J. L. (2021). Using Stochastic Computing for Virtual Screening Acceleration. /Electronics/, /10/(23), 2981. <https://doi.org/10.3390/electronics10232981> Electronics, MDPI, JCR (2020), ENGINEERING, ELECTRICAL & ELECTRONIC, Q3 revista 145 de 273, impact factor de 2.397, 0 cites
2. Frasser, C. F., Roca, M., & Rosselló, J. L. (2021). Optimal Stochastic Computing Randomization. /Electronics/, /10/(23), 2985. <https://doi.org/10.3390/electronics10232985> Electronics, MDPI, JCR (2020), ENGINEERING, ELECTRICAL & ELECTRONIC, Q3 revista 145 de 273, impact factor de 2.397, 0 cites
3. Becerra, V., Perales, F. J., Roca, M., Buades, J. M., & Miró-Julià, M. (2021). A Wireless Hand Grip Device for Motion and Force Analysis. /Applied Sciences/, /11/(13), 6036. <https://doi.org/10.3390/app11136036> Applied Sciences-Basel, MDPI, JCR (2020), ENGINEERING, MULTIDISCIPLINARY, Q2 es la revista 55 de 170, impact factor de 2.679, 0 cites
4. A. Morán, C. F. Frasser, M. Roca, J.L. Rosselló, "Energy-Efficient Pattern Recognition Hardware with Elementary Cellular Automata", IEEE Transactions on Computers

5. F Galán-Prado, A Morán, J Font, M Roca, JL Rosselló "Compact Hardware Synthesis of Stochastic Spiking Neural Networks" International journal of neural systems, 1950004-1950004. Octubre 2019. Q1 (IF 5.604)
6. M.L. Alomar, E. S. Skibinsky-Gitlin, C.F. Frasser, V. Canals, E. Isern, M. Roca, J.L. Rosselló "Efficient parallel implementation of reservoir computing systems", Neural Computing and Applications, published on line 06/Dec/2018 Vol 24, 15 pp. (<https://doi.org/10.1007/s00521-018-3912-4>), 2018 (Q1 IF 4.774)
7. V. Canals, C.F. Frasser, M.L. Alomar, A. Morro, A. Oliver, M. Roca, E. Isern, V. Martínez-Moll, E. García-Moreno and J.L. Rosselló "Noise Tolerant Probabilistic Logic for Statistical Pattern Recognition Application", Integrated Computer-Aided Engineering, Vol 24 pp 351-365, 2017 Q1 (IF 3.667)
8. J. Font, E. Isern, M. Roca, R. Picos, E. García-Moreno, "A new on-line bandwidth tuning approach for biquad OTA-C filters", Microelectronics Journal, Vol. 45, pp. 1053-1060, 2014
9. O. Camps, R. Picos, M. Roca, E. Isern, J. Font, A. Cerdeira, M. Estrada, E. García-Moreno, "Analytical appraisal of the importance of different fitting parameters in device compact models", Electronics Letters, Vol. 50, No. 11, pp. 832-833, 2014
10. E. García-Moreno, E. Isern, M. Roca, R. Picos, J. Font, J. Cesari, A. Pineda, "Temperature compensated floating gate CMOS dosimeter with frequency output", IEEE Transactions on Nuclear Science, Vol. 60, No. 5, pp. 4026-4030, 2013
11. R. Picos; E. García-Moreno; M. Roca; B. Iñíguez; M. Estrada; A. Cerdeira,, "Optimized design of an OTFT amplifier using the gm/ID methodology", IET Circuits Devices & Systems, Vol. 6, No. 2, pp. 136-140, 2012
12. E. García-Moreno, E. Isern, M. Roca, R. Picos, J. Font, J. Cesari, A. Pineda, "Floating gate CMOS dosimeter with frequency output", IEEE Transactions on Nuclear Science, Vol. 59, No. 2, pp. 373-378, 2012
13. J. Font, E. Isern, M. Roca, R. Picos, M. Font, E. García-Moreno, "Band-Pass Filter Design with Diagnosis Facilities Based on Predictive Techniques", Journal of Electronic Testing: Theory and Applications, Vol. 27, No. 6, pp. 685-696, 2011
14. K. Suenaga, E. Isern, R. Picos, S. Bota, M. Roca, E. García-Moreno, "Application of Predictive Oscillation-Based Test to a CMOS OpAmp", IEEE Transactions on Instrumentation and Measurement, Vol. 59, pp. 2076-2082, 2010

C.2. Research projects

Project: Desarrollo de sistemas inteligentes hardware con alta eficiencia energética para aplicaciones de computación "edge" y de supercomputación. PID2020-120075RB-I00

Empresa/Administración Ministerio de Ciencia e Innovación

Duración, 2021-2024 **Investigador/a Principal:** José Luis Rosselló/ Miquel Roca Adrover

Importe: 152.702€ **Número de investigadores participantes:** 7

Project: Sistemas adaptativos en hardware de redes neuronales profundas para procesamiento inteligente de audio. PDC2021-121847-I00

Empresa/Administración Ministerio de Ciencia e Innovación

Duración, 2021-2023 **Investigador/a Principal:** José Luis Rosselló/ Miquel Roca Adrover

Importe: 90.850€ **Número de investigadores participantes:** 7

Project: Desarrollo de sistemas de computación no convencional de alto rendimiento y sus aplicaciones prácticas TEC2017-84877-R MINECO

PNTE - Prog. Nac. Tecn. Electrónica y de Comunicaciones **Empresa/Administración**



Duración, 2018-2020 **Investigador/a Principal**: José Luis Rosselló/ Miquel Roca Adrover
Importe: 169.000€ **Número de investigadores participantes**: 6

Project: Estudio e implementación de Neuromórficos en Hardware TEC2014-56244-R MINECO
PNTE - Prog. Nac. Tecn. Electrónica y de Comunicaciones **Empresa/Administración**
Duración, 2015-2017 **Investigador/a Principal**: José Luis Rosselló/ Rodrigo Picos Gayá
Importe: 170.610€ **Número de investigadores participantes**: 6

Project: Diseño y optimización de sensores de radiación ionizante integrados en Tecnologías Microelectrónicas TEC2013-40677-P
MICINN
PNTE - Prog. Nac. Tecn. Electrónica y de Comunicaciones **Entidades participantes**:
Duración, desde: 2014 **hasta**: 2014 **Investigador/a Principal**: Miguel Roca Adrover/
Eugenio Isern Riutort
Importe: 10.000 **Número de investigadores participantes**: 6

Project : Organización de la 8th Spanish Conference on Electron Devices TEC2010-09516-E
MICINN
PNTE - Prog. Nac. Tecn. Electrónica y de Comunicaciones
Duración, desde: 2010 **hasta**: 2011 **Investigador/a Principal**: Eugenio Garcia Moreno
Importe: 9.000,00 **Número de investigadores participantes**: 4

Project: Dosímetro de radiación ionizante con tecnologías CMOS (DRIT-CMOS)
CDTI - Centro Desarrollo Tecnológico e Industrial
PDAD - Proyectos de Investigación Aplicada y Desarrollo
Número de proyecto/contrato: IDI-20101454 **Importe**: 27.000,00
Duración, desde: 2010 **hasta**: 2012 **Investigador/a Principal**: Eugenio Garcia Moreno
Número de investigadores participantes: 6

C.3. Contracts, technological or transfer merits

Cátedra EndesaRed UIB de Innovación Energética.
Aportación anual de 39.000 €. Investigador Principal (director) : Miquel Roca Adrover (desde 2008 hasta diciembre 2018)

C.4. Patents

Patent: “Dispositivo de detección, identificación y conversión a sonido de colores de una superficie”
Inventores: Rossi, J.; Roca, M.; Varona, X.; Perales, F.J.
Núm. de solicitud: ES2373153 **País de prioridad**: ESPAÑA **Fecha de prioridad**: 2012
Entidad Titular: UIB - Universitat de les Illes Balears

Modelo de Utilidad: “Mando portátil para detección de movimientos y fuerza de prensión”
Inventores: Fco. Perales; Miquel Roca; Víctor Becerra
Núm. de solicitud: ES1079025 **País de prioridad**: ESPAÑA **Fecha de prioridad**: 2013
Entidad Titular: UIB - Universitat de les Illes Balears

Patent: “Sensor, Dispositivo y Método de Medición de Radiación basado en Transistores de Puerta Flotante”
Inventores: E. García ; E. Isern ; M. Roca ; R. Picos ; J. Font ; A. Pineda ; J. Cesari.
Núm. de solicitud: p201231486 **País de prioridad**: ESPAÑA **Fecha de prioridad**: 2012
Entidad Titular: Integrated Circuits Málaga S.L.

C.5 PhD thesis directed

1. Título: Developments for an embedded and reliable floating gate dosimeter
Doctorando: Joan Cesari Bohigas Univ. de les Illes Balears
Fecha: 2019
Calificación: Excelente
 2. Título: Advanced Test of Analog ICs: oscillation-based and predictive test (codirección)
Doctorando: Joan Font Rosselló Univ. de les Illes Balears
Fecha: 2010
Calificación: Apto cum Laude
- Calificación: Apto cum Laude

C.6 I+D+I activities organization

Título: 8th Spanish Conference on Electron Devices. CDE11.

Tipo de actividad: Miembro del comité organizador

Ámbito: Internacional. Palma de Mallorca (España) **Año:** 2011

Título: International Workshop on Power and Timing Modeling, Optimization and Simulation (PATMOS) 2014.

Tipo de actividad: Program Chair

Ámbito: Internacional. Palma de Mallorca (España) **Año:** 2014

Título: 12th International Conference on Design & Technology of Integrated Systems in Nanoscale Era (DTIS 2017)

Tipo de actividad: General co-chair

Ámbito: Internacional. Palma de Mallorca (España)

Año: 2017

C.7 Relaciones con empresas

IC-Málaga (Convenio fabricación circuitos integrados y colaboración en I+D)
Endesa (Cátedra Endesa)