

**Part A. PERSONAL INFORMATION**

**CV date** 01/09/2023

First and Family name	Víctor Manuel Brea Sánchez		
Social Security, Passport, ID number			
Researcher numbers	Researcher ID		

**A.1. Current position**

Name of University/Institution	Universidade de Santiago de Compostela		
Department	Centro Singular de Investigación en Tecnoloxías Intelixentes (CiTIUS)		
Address and Country	Rúa Jenaro de la Fuente s/n		
Phone number	E-mail		
Current position	Associate Professor	From	
Espec. cód. UNESCO	330793, 330703, 330714, 330719, 220990, 22030, 220308		
Palabras clave	Microelectronic design, CMOS sensors, integrated circuit design, electronic technology, image and signal processing		

**A.2. Education**

PhD/Degree	University	Year
Physics PhD	University of Santiago de Compostela	2003
Physics Degree	University of Santiago de Compostela	1996

**A.3. JCR articles, h Index, thesis supervised...**

Number of PhD tesis supervised: 10 (+ 2 PhD thesis currently under supervision)  
 Positive research evaluations every six years (sexenios CNEAI): 3 (last one in Dec. 2017).  
 Sexenio Transferencia 2013-2018  
 Website: <https://citius.usc.es/equipo/persoal-adscrito/victor-manuel-brea-sanchez>  
 Total nº of citations: 1376 (GoogleScholar)  
 Average citations/year during the last 5 years (2019- 2023): 146.4 cites/year @GoogleScholar  
 Nº JCR papers @Q1 and @Q2 across 2019-2023: 15; 11@Q1, 4@Q2  
 h-index: 18 (GoogleScholar)

**Part B. CV SUMMARY Timeline 2012-2021 (max. 3500 characters, including spaces)**

Víctor Brea is an associate profesor (profesor titular universidad) since Dec. 5th 2016 at Univ. of Santiago de Compostela. He is a researcher of Centro Singular de Investigación en Tecnoloxías Intelixentes (CiTIUS) in the same university. His main research areas are: CMOS design for computer vision and energy harvesting as well as computer vision, mainly focused on deep learning models.

**Scientific contribution-** Víctor Brea is currently leader of WP3 of the H2020 project [MISEL](#), with a budget of 653.351,25 euros granted to CiTIUS for the period 01/01/2020- 31/12/2024. Also, Víctor Brea is supervising two PhD students in the [ITN H2020 MENLAOS NT](#) throughout the period 01/01/2020- 31/12/2023, where CiTIUS is a partner. He has also been principal investigator of three research projects funded by the Spanish Ministry, amounting to more than 550,000 euros. All in all, as principal investigator, Víctor Brea has achieved more than 1,45 M of euros in scientific projects. In terms of publications, Víctor Brea has published 35 JCR papers; with 16 Q1 and 10 Q2 papers. We also highlight 1 USPTO patent and 3 OEPM patents. Finally, V. Brea also serves in the advisory board of Workshop on Smart Cameras (WASC), and as a review committee member of the Sensory Systems Technical Committee (SSTC) since 2015, and as a member of Cellular Nano-scale Networks and Array Computing Technical Committee (CNNA-TC), both of them of the Circuits and Systems Society (CASS) of IEEE. He has also been program chair of Int. Conference on Distributed Smart Cameras (ICDSC) of ACM during 2016 and 2017 editions.

**Society contribution-** Víctor Brea has contributed to the society in two different ways, namely: i) through PhD training, putting highly qualified personnel in the industry (see below), and ii) through transfer projects with industry. In the latter, Víctor Brea has led industrial projects with an amount of approximately 300.000 euros in the period 2017-2021, highlighting almost more than 80,000 euros with Indra in the field of Intelligent Transport Systems, and more than 110,000 euros with the International Iberian Nanotechnology Laboratory ([INL](#)) in Braga (Portugal) in the field of microelectronics, with CMOS circuits on energy harvesting.

**Training achievements-** Víctor Brea has supervised 10 PhD students in the fields of computer vision and CMOS vision sensors. All of these students have been granted with honors (Sobresaliente Cum Laude), and 6 of them with the International Doctoral Mention. The last 5 PhDs in the period 2017-2021 have currently these positions: one of them- Daniel García Lesta- hired by the H2020 project [MISEL](#), two of them- Brais Bosquet and Mauro Fernández- as data scientists in the company [Obvious Eat](#), based in Santiago de Compostela, one of them- Esteban Ferro Santiago- in Jaguar- Land Rover- in Vigo (Galicia), and the last one- Julio Illade- at [AIMEN](#) Technology Center, in Porriño (Galicia). Finally, Víctor Brea is supervising 2 more PhD students as Early Stage Researchers (ESR's) of the [H2020 ITN MENELAOS NT](#), with CiTIUS as a partner.

## Part C. RELEVANT MERITS

### C.1. Publications (10 journals, only first and second quartile JCR)

1) Mauro Fernández-Sanjurjo, M. Mucientes, **Víctor M. Brea**. "Real-Time Multiple Object Visual Tracking for Embedded GPU Systems". IEEE Internet of Things Journal, vol. 8, no. 11, pp. 9177-9188, 2021. DOI: [10.1109/JIOT.2021.3056239](#). **JCR 2020- 9.471, 94.69%, 15/273 in Engineering, Electrical & Electronic.**

2) Brais Bosquet, Manuel Mucientes, Víctor M. Brea. "STDnet-ST: Spatio-Temporal ConvNet for Small Object Detection". Pattern Recognition, Elsevier, vol. 116, No. 107929, 2021. DOI: [10.1016/j.patcoq.2021.107929](#). **JCR 2020- 7.74, 92.86%, 20/273 in Engineering, Electrical & Electronic.**

3) D. Cabello, E. Ferro, Ó Pereira-Rial, B. Martínez-Vázquez, **V.M. Brea**, J.M. Carrillo, and P. López. "On-Chip Solar Energy Harvester and PMU with Cold Start-Up and Regulated Output Voltage for Biomedical Applications". IEEE Transactions on Circuits and Systems I: Regular Papers, vol. 67, no. 4, pp. 1103-1114, April 2020. DOI: [10.1109/TCSI.2019.2944252](#). **JCR 2019- 3.605, 70.88%, 80/273 in Engineering, Electrical & Electronic.**

4) Brais Bosquet, Manuel Mucientes, Víctor M. Brea. "STDnet: Exploiting high resolution feature maps for small object detection". Engineering Applications of Artificial Intelligence, Elsevier, vol. 91, No. 103615, 2020. DOI: [10.1016/j.engappai.2020.103615](#). **JCR 2020- 6.212, 89.19%, 30/273 in Engineering, Electrical & Electronic.**

5) Mauro Fernández-Sanjurjo, Brais Bosquet, Manuel Mucientes, **Víctor M. Brea**. "Real-time visual detection and tracking system for traffic monitoring". Engineering Applications of Artificial Intelligence, Elsevier, vol. 85, pp. 410-414, No. October 2019, 2019. DOI: [10.1016/j.engappai.2019.07.005](#). **JCR 2019- 4.201, 81.77%, 49/266 in Engineering, Electrical & Electronic.**

6) Esteban Ferro, **Víctor Manuel Brea**, Paula López, Diego Cabello. "Micro-Energy Harvesting System including a PMU and a Solar Cell on the same Substrate with Cold Start-Up from 2.38 nW and Input Power Range up to 10 uW using Continuous MPPT". IEEE Transactions on Power Electronics, vol. 34, no. 6, pp. 5105-5116, 2019. DOI: [10.1109/TPEL.2018.2877105](#). **JCR 2019- 6.373, 91.92%, 22/266, in Engineering, Electrical & Electronic.**

7) Beatriz Blanco-Filgueira, Daniel García-Lesta, Mauro Fernández-Sanjurjo, **Víctor M. Brea**, Paula López. "Deep Learning-Based Multiple Object Visual Tracking on Embedded System for IoT and Mobile Edge Computing Applications". IEEE Internet of Things Journal, vol. 6, no. 3, pp. 5423-5431, 2019. DOI: [10.1109/JIOT.2019.2902141](#). **JCR 2019- 9.936, 96.80%, 9/266 in Engineering, Electrical & Electronic.** Google Scholar cites (01/09/2023): 78.

8) M. Suárez, **V.M. Brea**, J. Fernández-Berni, R. Carmona-Galán, D. Cabello, A. Rodríguez-Vázquez. "Low-Power CMOS Vision Sensor for Gaussian Pyramid Extraction", IEEE Journal of Solid-State Circuits, vol. 52, no. 2, pp. 483-495, February 2017. DOI: [10.1109/JSSC.2016.2610580](#). **JCR 2017: 4.075, 87.12%, 34/260. Engineering, Electrical&Electronics.**

9) D. García-Lesta, D. Cabello, E. Ferro, P. López, **V.M. Brea**. "Wireless Sensor Network with Perpetual Motes for Terrestrial Snail Activity Monitoring", IEEE Sensors Journal, vol. 17, no.

15, pp. 5008-5015, August 2017. DOI: 10.1109/JSEN.2017.2718107. JCR 2017: 2.512, **77.87%**, **14/61**. Instruments & Instrumentation.

**10)** E. Ferro, **V.M. Brea**, P. López, D. Cabello. “Dynamic Model of Switched-Capacitor DC-DC Converters in the Slow-Switching Limit including Charge Reusing”, IEEE Transactions on Power Electronics, vol. 32, no. 7, pp. 5293-5311, July 2017. DOI: 10.1109/TPEL.2016.2607800. **JCR 2017- 6.812, 94.81%, 14/260, in Engineering, Electrical & Electronic.**

### C.2. Research projects and grants (only as a principal investigator)

**1)** Reference: Grant Agreement 101016734 ([MULTISPECTRAL INTELLIGENT VISION SYSTEM WITH EMBEDDED LOW-POWER NEURAL COMPUTING | MISEL Project | Fact Sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#))

Title: MISEL: Multispectral Intelligent Vision System with Embedded Low-Power Neural Computing

**Principal investigators (IP, Co-IP,...): Jacek Flak (VTT), Víctor Brea (Work Package 3)**

Funding: H2020-EU.1.2 Excellent Science- Future and Emerging Technologies (FET). H2020EU.1.2.2-FET Proactive. FETPROACT-09-2020- Neuromorphic Computing Technologies

Time: 01/01/2021- 31/12/2024

Amount: 653.301,25 €

**2) Reference: PID2021-128009OB-C32**

Title: SEMIoTICS: Inteligencia Artificial en el borde: soluciones de bajo consumo de potencia

**Principal investigators (IP, Co-IP,...): Víctor Manuel Brea Sánchez, Paula López Martínez**

Funding: Plan Nacional de I+D+i AEI. Ministerio de Ciencia, Innovación y Universidades.

Time: 01/09/2022- 31/08/2025

Amount: 186.945,00 €

**2) Reference: RTI2018-097088-B-C32**

Title: Sensores CMOS de Visión, Gestión de Energía y Seguimiento de Objetos sobre GPUs Empotradas

**Principal investigators (IP, Co-IP,...): Víctor Manuel Brea Sánchez, Paula López Martínez**

Funding: Plan Nacional de I+D+i Retos 2018. Ministerio de Ciencia, Innovación y Universidades.

Time: 01/01/2019- 31/12/2021

Amount: 81.796,00 €

**3) Reference: 0181\_NANOEATERS\_1\_E\_2**

Title: Nanoeaters-II: Transfer and valorization of NANOTECHNOLOGIES to innovative PYMES from the Euroregion. Work Package: Eyepress: Autonomous Implantable System for Monitoring of IntraOcular Eye Pressure

Funding: Interreg febrero 2016 España- Portugal. Socios colaboradores: Universidad de Santiago: CiTIUS, CiMUS, e Iberian Nanotechnology Lab (INL), Braga (Portugal).

Principal investigator, of the project: GAIN (Xunta de Galicia). PI of our workpackage: **Víctor Manuel Brea Sánchez**

Funding: Comisión Europea. Proyecto POCTEP. Convocatoria Interreg España-Portugal

**Principal investigator: Víctor Manuel Brea Sánchez**

Partners: Universidad de Santiago de Compostela, Int. Nanotechnology Lab. (INL), Braga, Portugal

Period: 01/01/2017 to 31/12/2019

Amount: 126.707,27€

### C.3. Contracts (only as a principal investigator)

**1)** Title: Sistema de Visión Artificial para Realizar Estudios de Tráfico mediante Imágenes captadas por RPAS (Artificial Vision for Traffic study through images from RPAS)

Company: Aplygenia, S.L.

Partners: Universidad de Santiago de Compostela, Aplygenia, S.L..

Period: 01/11/2016 to 30/04/2018

**Principal investigators: Víctor Manuel Brea Sánchez, Manuel Mucientes Molina**

Amount: 45.089,44 euros

Funding: CDTI. Call NEOTEC 2015

**2)** Title: Exploitation of intellectual property right: “vTrack4VC: sistema de tracking para el conteo y clasificación de vehículos” (vTrack4VC: tracking system for vehicle counting and classification)

Company that exploits the intellectual property 03/2016/754: Aplygenia, S.L.

Partners: Universidad de Santiago de Compostela

Period of exploitation: 5 years since 05/07/2016

Royalties: 30%

**Principal investigators: Víctor Manuel Brea Sánchez, Manuel Mucientes Molina**

**3)** Title: Desarrollo de un sistema de detección y seguimiento de objetos para torres de control de aeropuerto con Deep Learning (DL)- Fase 1 (Object Detection and Tracking for Control Towers through Deep Learning (DL)- Stage 1

Company: Indra

Partners: Universidad de Santiago de Compostela

Period: 01/09/2018 to 31/03/2019

Amount: 81.960 euros

**Principal investigators: Víctor Manuel Brea Sánchez, Manuel Mucientes Molina**

#### C.4. Patents

**1)** Authors: M. Suárez; **Víctor Brea**; F. Pardo; A. Rodríguez-Vázquez; R. Carmona-Galán

Title: Three Dimensional CMOS Image Processor for Feature Detection

Owner: Universidad de Santiago de Compostela, IMSE-CNM

Ref.: US 8,942,481 B2

Country: España, Galicia

Approval: 27/01/2015

Exploitation region: Estados Unidos

**2)** Authors: Esteban Ferro Santiago, **Víctor Manuel Brea Sánchez**, Paula López Martínez, Diego Cabello Ferrer

Title: Sistema de microrrecolección de energía con unidad de gestión de energía y celda solar en un único sustrato de silicio (microenergy harvesting system with power management unit and solar cell in the same silicon substrate)

File: 201730001 (topography semiconductor protection). Country: Spain

**Institution: Oficina Española de Patentes y Marcas (OEPM).**

Date (previous exam): 05/12/2017.

Owner: Universidad de Santiago de Compostela

#### C.5, C.6, C.7... (e. g., Institutional responsibilities, memberships of scientific societies...)

- **1)** Member of the societies Circuits and Systems Society (CASS) of IEEE: Cellular Nano-scale Networks and Array Computing Technical Committee (CNNA-TC) and Sensory Systems Technical Committee (SSTC). Review Committee Member SSTC at 2017, 2018, 2019, 2020, 2021 and 2022 editions of Int. Symposium of Circuits and Systems (ISCAS)
- **2)** Project reviewer (expert) at H2020 for call H2020-ICT-2 Nanoelectronics
- **3)** Project Reviewer Spanish Programme I+D+i 2019, 2020, 2021, 2022
- **4)** Member of the advisory board of Workshop of Architecture of Smart Cameras (WASC)
- **5)** Program Chair of Int. Conference on Distributed Smart Cameras (ACM) during the 2017 and 2018 editions
- **6)** Associate Editor International Journal of Real-Time Image Processing
- **7)** Guest Editor “Special Issue on Advances on Smart Camera Architectures for Real-Time Image Processing”. International Journal of Real-Time Image Processing, vol. 14, no. 3, pp. 635-636, 2018.