

CURRICULUM VITAE ABREVIADO (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

First name	ALEJANDRO		
Family name	LINARES	BARRANCO	
Gender (*)	MALE	Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail			
Open Researcher and Contributor ID (ORCID)			

A.1. Current position

Position	Professor (CU)		
Initial date	JUNE 2021		
Institution	University of Seville		
Department/Center	Architecture and Technology of Computers	Research Institute on Computer Engineering (I3US)	
Country	SPAIN	Teleph. number	
Key words	Neuromorphic Engineering; Robotics; VLSI; FPGA; Real-time;		

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
2009-2021	Associate Professor / University of Seville / Spain
2003-2009	Assistant Professor / University of Seville / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD on Industrial Informatics	University of Seville	2003
MSc on Industrial Informatics	University of Seville	2002
BSc on Computer Engineering	University of Seville	1998

Part B. CV SUMMARY (max. 5000 characters, including spaces)

CNEAI awards (sexenios): 4 Research awards for periods: 1999-2005, 2006-2011, 2012-2017, 2018-2023), 1 Knowledge Transfer award until the year 2015.

PhD advisor concluded in the last 10 years: 5 (10 in total)

Papers at JCR-Q1: 24/54 (JCR), 32/54 (SJR) (<https://prisma.us.es/investigador/2199>)

Google Scholar (<https://scholar.google.es/citations?user=oihgDkoAAAAJ&hl=es>): 239 papers, 4779 cites (2177 since 2021), h-index: 34 (25 since 2021), i10: 90 (46 since 2021).

ResearchGate (https://www.researchgate.net/profile/Alejandro_Linares-Barranco): 239 papers, 56680 reads, 3824 cites, RIS=1753, (above 95% of researchers in this network).

ScopusID (<http://www.scopus.com/authid/detail.url?authorId=8960244800>): for 200 papers, 2988 cites from 1930 papers, h-index: 29. 2024 shows the max collected cites: 293

ResearcherID (<http://www.researcherid.com/rid/B-7087-2011>): 196 documents until 2025, where 181 are papers indexed at Web of Science, with 2248 cites and h-index of 26.

My research focuses on: Neuromorphic Engineering, co-design HW/SW embedded systems; microcontrollers & real-time OS; FPGAs; Event-driven Neuro-inspired systems (AER) and interfaces; Neuro-robotics; event-driven vision/audio processing; deep learning. I started my research in the European project CAVIAR in 2002 with the development of chip-to-chip / chip-to-computer interfaces for neuromorphic AER systems (PCB, VHDL, FPGA, microcontrollers, C++, Java) and simulation tools for theoretical studies on the transformation of static images to AER format, the central focus of my doctoral thesis. This allowed me to perform several research visits abroad, which resulted in numerous publications both in JCR-Q1 journals (IEEE, IEE, ELSEVIER, SPRINGER, ...) and in multiple high-impact conferences (CORE & GRIIN databases). To date, the neuromorphic line has allowed me to serve as IP at an



European project (SMALL), six projects of the Spanish R+D+i plan (VULCANO, BIOSENSE, COFNET, MINDROB, NASSAI and NEKOR), three Excellence projects of the Andalusian Government (MINERVA, DAFNE, WITCH), one industrial transfer project (PROMETEO) and two international projects with private funding (Samsung Ltd.) from 2015 to 2020 (NPP and NPP2). These participations as IP and others as a researcher have allowed me to accumulate the publications and research merits expressed in this CVA. The PROFESSIONAL EXPERIENCE I had in SAINCO-ABENGOA in 1999-2000 (design of digital circuits in VHDL for FPGA and ASIC for Power Line communications stage) gave me perspective and experience for the development of my current research. In 2014 we created a Spinoff company of the Univ. of Seville (EBT COBER SL - www.t-cober.es) of which I am a partner and with which we manufacture robotic biomedical analysis instruments for VITRO SL, among other clients/activities. I have taught in the second cycle of computer engineering of the 1997 syllabuses, in the current degrees of Computer Engineering and Industrial Electronics Engineering (2010 syllabuses); master degrees of Computing, Computer and Network Engineering (until 2017), Computer Engineering, Biomedical Engineering and Digital Health, and Teaching Staff (MAES); and in the PhD programs of Industrial Informatics, Systems and Installations for Industry and at other universities such as UZH/ETHZ, Univ. Cádiz, Univ. Politécnica de Cartagena. I've done several research visits (three months or longer periods) to Bielefeld U., Ulster U. and Zurich U. I have directed more than 80 PFC, TFG, DEA, TFM, and 10 doctoral theses to date, where some of these students work at important companies in Germany, Switzerland and Italy, and others remain at Academia. Regarding MANAGEMENT in my university, I belong to several commissions of both the School and Department, including the quality of several degrees. I have served as SECRETARY of my dept (2013-2017) and as DIRECTOR (2017-2021). I have been secretary of the doctoral program of Installations and Systems for the Industry from 2017 to 2025, where I'm currently the coordinator of the PhD program and president of the Academic Committee. I have also served as IP at several collaboration agreements between several companies (national and foreign) and the FIDETIA foundation, based in my School of Computer Engineering in Seville. These agreements have been oriented to internships, training of companies' personnel and transfer of knowledge with software and hardware applications for FPGA and microcontrollers (for example Samsung, Intel, AERTEC, VITRO, McPuarsa, Synsense, Rexen, Hitachi, Toshiba and others). As well as the production and mentoring of on-line training courses approved by the Junta de Andalucía and oriented to teachers. The Junta de Andalucía has recognized five research tranches "Complementos Autonómicos" in 2019.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions): corresponding author. ($n^{\circ}x / n^{\circ}y$): position / total authors. SCOPUS (#citations). (AC) = corresponding author

1. Ortner, T., Petschenig, H., Vasilopoulos, A., **Linares-Barranco, A.** et al. (8/10) Rapid learning with phase-change memory-based in-memory computing through learning-to-learn. Nat Commun 16, 1243 (2025). <https://doi.org/10.1038/s41467-025-56345-4>
2. Casanueva-Morato, Daniel ; Wu, Chenxi; Indiveri, Giacomo; **Linares-Barranco, Alejandro**; Domínguez-Morales, Juan P. **2025**. Towards a Dynamic Closed-Loop Neuromorphic Trajectory Interpolation Model: Hardware Emulation and Software Simulation. IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS II-EXPRESS BRIEFS (1549-7747 / 1558-3791) SCOPUS (1) <https://doi.org/10.1109/TCSII.2025.3582362>
3. Schoepe, Thorben (AC); Gutiérrez-Galán, Daniel; Domínguez-Morales, Juan P.; Greateorex, Hugh; Jiménez-Fernández, Ángel; **Linares-Barranco, Alejandro**; Chicca, Elisabetta. (6/7). **2023**. Closed-loop sound source localization in neuromorphic systems. Neuromorphic Computing and Engineering. Vol 3. Num. 2. Pps 1-18. ISSN 2634-4386. SCOPUS (14) <https://doi.org/10.1088/2634-4386/acdaba>
3. Canas-Moreno, Salvador (AC); Piñero-Fuentes, Enrique; Ríos-Navarro, Antonio; Cascado-Caballero, Daniel; Pérez-Peña, Fernando; **Linares-Barranco, Alejandro**. (6/6). **2023**. Towards neuromorphic FPGA-based infrastructures for a robotic arm. AUTONOMOUS ROBOTS. SPRINGER. Vol 47. Pps. 947-961. ISSN 0929-5593, ISSN 1573-7527. SCOPUS (13) <https://doi.org/10.1007/s10514-023-10111-x>
4. Gutiérrez-Galán, Daniel (AC); Schoepe, Thorben; Domínguez-Morales, Juan P.; Jiménez-Fernández, Ángel; Chicca, Elisabetta; **Linares-Barranco, Alejandro**. (6/6). **2022**. An event-based digital time difference encoder model implementation for neuromorphic systems. IEEE

5. Gutiérrez-Galán, D. (AC); Domínguez-Morales, J. P.; Jiménez-Fernández, A.; **Linares-Barranco, A.**; Jiménez-Moreno, G.(4/5). **2021**. OpenNAS: Open Source Neuromorphic Auditory Sensor HDL code generator for FPGA implementations. NEUROCOMPUTING. ELSEVIER. Vol. 436. Pps. 35-38. ISSN 0925-2312. SCOPUS (12) <https://doi.org/10.1016/j.neucom.2020.12.062>

6. **Linares-Barranco, Alejandro (AC)**; Pérez-Peña, Fernando; Jiménez-Fernández, Ángel; Chicca, Elisabetta. (1/4). **2020**. ED-BioRob: a neuromorphic robotic arm with FPGA-based infrastructure for bio-inspired spiking motor controllers. Frontiers in Neurorobotics. Vol. 14. Pps. 1-12. ISSN 1662-5218. SCOPUS (20) <https://doi.org/10.3389/fnbot.2020.590163>

7. Gutiérrez-Galán, Daniel (AC); Domínguez-Morales, J.P.; Pérez-Peña, Fernando; Jiménez-Fernández, Ángel; **Linares-Barranco, Alejandro**. (5/5). **2020**. Neuropod: a real-time neuromorphic spiking CPG applied to robotics. NEUROCOMPUTING. ELSEVIER. Vol. 381. Pps.10-19. ISSN 0925-2312. SCOPUS (56), <https://doi.org/10.1016/j.neucom.2019.11.007>

8. Tapiador-Morales, Ricardo (AC); **Linares-Barranco, Alejandro**; Jiménez-Fernández, Ángel; Jiménez-Moreno, Gabriel. (2/4). **2019**. Neuromorphic LIF Row-by-Row Multiconvolution Processor for FPGA. IEEE TBCAS. IEEE. Vol. 13-1. Pps.159-169. ISSN 1932-4545. SCOPUS (36), <https://doi.org/10.1109/TBCAS.2018.2880012>

9. Aimar, Alessandro (AC); Mostafa, Hesham; Calabrese, E.; et al; Delbruck, Tobi; **Linares-Barranco, Alejandro**. (9/11). **2019**. NullHop: A Flexible Convolutional Neural Network Accelerator Based on Sparse Representations of Feature Maps. IEEE TNNLS. IEEE. Vol.30. Pp.644-656. ISSN 2162-2388. SCOPUS (222), <https://doi.org/10.1109/TNNLS.2018.2852335>

10. **Linares-Barranco, Alejandro**; Pérez-Peña, Fernando; Moeys, Diederik Paul; Gómez-Rodríguez, Francisco; Jiménez-Moreno, Gabriel; Liu, Shih Chii; Delbruck, Tobi. (1/7). **2019**. Low latency event-based filtering and feature extraction for dynamic vision sensors in real-time FPGA applications. IEEE ACCESS. IEEE. 7, pp.134926-134942. ISSN 2169-3536. SCOPUS (42), <https://doi.org/10.1109/ACCESS.2019.2941282>

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

1. X. Iturbe, **A. Linares-Barranco** et al. (34/60), "Neuromorphic Technology Insights in Spain," 2024 IEEE 24th International Conference on Nanotechnology (NANO), Gijón, Spain, **2024**, pp. 1-11, doi: 10.1109/NANO61778.2024.10669907.

2. D. Casanueva-Morato, **A. Linares-Barranco**, "Integrating a hippocampus memory model into a neuromorphic robotic-arm for trajectory navigation," 2024 IEEE International Symposium on Circuits and Systems (ISCAS), Singapore, Singapore, **2024**, doi: 10.1109/ISCAS58744.2024.10558362.

3. **A. Linares-Barranco**, L. Prono, R. Lengenstein, G. Indiveri and C. Frenkel, "Adaptive Robotic Arm Control with a Spiking Recurrent Neural Network on a Digital Accelerator," 2024 31st IEEE International Conference on Electronics, Circuits and Systems (ICECS), Nancy, France, **2024**, doi: 10.1109/ICECS61496.2024.10849226.

4. E. Piñero-Fuentes, **A. Linares Barranco** et al., "A Hybrid Neuromorphic Robotic-Arm Lemniscate Trajectories Dataset for Learning-Based Applications," 2024 31st IEEE International Conference on Electronics, Circuits and Systems (ICECS), Nancy, France, **2024**, doi: 10.1109/ICECS61496.2024.10849213.

5. Rios-Navarro, A.; Guo, S.; Abarajithan, G.; Vijayakumar, K.; **Linares-Barranco, A.**; Aarrestad, T.; Kastner, R.; Delbruck, T. Within-Camera Multilayer Perceptron DVS Denoising. **2023 (Lecture)**. IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops (ISSN 2160-7508). CVPR. Vancouver-Canadá.

6. Rios-Navarro, A. ; Pinero-Fuentes, E.; Canas-Moreno, S.; Javed, A.; Harkin, J.; **Linares-Barranco, A.** LIPSFUS: A neuromorphic dataset for audio-visual sensory fusion of lip Reading. **2023 (Lecture)** Proceedings - IEEE International Symposium on Circuits and Systems. ISSN 0271-4310. ISCAS. Monterey-CA. USA.

7. Piñero-Fuentes, E. ; Canas-Moreno, S.; Ríos-Navarro, A.; Cascado-Caballero, D.; Jiménez-Fernández, A.; **Linares-Barranco, A.** An MPSoC-based on-line edge infrastructure for embedded neuromorphic robotic controllers. **2022 (Lecture)**. Proceedings - IEEE International Symposium on Circuits and Systems. ISSN 0271-4310. ISCAS. Austin. USA.

8. **Linares-Barranco, A.**; Piñero-Fuentes, E.; Canas-Moreno, S.; Ríos-Navarro, A.; Maryada; Wu, Chenxi; Zhao, Jingyue; Zendrikov, D.; Indiveri, G. Towards hardware Implementation of WTA for CPG-based control of a Spiking Robotic Arm. **2022 (Lecture)**. Proceedings - IEEE International Symposium on Circuits and Systems. ISSN 0271-4310. ISCAS. Austin. USA.
9. Tapiador-Morales, R.; Ríos-Navarro, A.; Dominguez-Morales, J.P.; Gutierrez-Galan, D.; **Linares-Barranco, A.**. Spiking row-by-row FPGA multi-kernel and multi-layer convolution processor. **2019 (Lecture)**. Proceedings - 29th International Conference on Field-Programmable Logic and Applications, FPL 2019. Barcelona-Spain.

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

1. PDC2023-145841-C33, "IPcore Sensor Neuromórfico de Audición para IA por pulsos en el borde (NASSAI). Ministerio de Ciencia e Innovación (Nacional). **IP: Linares Barranco, Alejandro**. 01/01/2024-31/12/2025. 87.579,80 €
2. PID2023-149071NB-C54. "Procesamiento neuromórfico y cognición para la fusión sensorial en robótica (NEKOR)". Ministerio de Ciencia, Innovación y Universidades (Nacional). **IP: Linares Barranco, Alejandro**. 01/09/2024-31/12/2028. 137.500,00 €
3. TSI-069100-2023-001. "USECHIP: Cátedra en Microelectrónica de la Universidad de Sevilla". Ministerio de Asuntos Económicos y Transformación Digital (Nacional). **IP: Antonio Acosta Jiménez**. 12/09/2024-30/06/2026. 4.200.000,00 €
4. PID2019-105556GB-C33, Percepción y cognición neuromórfica para actuación robótica de alta velocidad (MIND-ROB). Ministerio de Ciencia, Innovación y Universidades. **IP: Linares Barranco, Alejandro**. 01/06/2020-31/05/2024. 262.812 €.
5. PCI2019-111841-2, Arquitecturas Memristivas Pulsantes para Aprender a Aprender (SMALL). Ministerio de Ciencia, Innovación y Universidades. CHISTERA-H2020. **IP: Linares Barranco, Alejandro**. 01/01/2020-31/07/2023. 150.000 €.
6. US-1381619, Diagnóstico asistido de señales biomédicas mediante clasificación con Deep-Learning incremental (DAFNE). Consejería de Economía, Conocimiento, Empresas y Universidad. Junta de Andalucía. **IP: Linares Barranco, Alejandro**. 01/01/2022-31/05/2023. 90.000 €.
7. TEC2016-77785-P, Sistema Cognitivo de Fusión Sensorial de Visión y Audio por Eventos (COFNET). Ministerio de Economía y Competitividad. **IP: Linares Barranco, Alejandro**. 30/12/2016-29/12/2020. 223.850 €.

C.4. Contracts, technological or transfer merits

1. Diseño Hardware de Controladores Semafóricos para Tráfico Rodado (PCB Traffic Controller - PCBTC) Aeronaval de Construcciones e Instalaciones, S.A.. **CoIP: Linares-Barranco, Alejandro**. 15/11/2021-30/07/2022. 22.000 €.
2. AT17_5410_USE. Prototipo de dispositivo médico de apoyo al diagnóstico de cáncer de próstata mediante teorías de clasificación de imagen con Deeplearning (PROMETEO). Consejería de Economía, Conocimiento, Empresas y Universidad (Autonómico). **IP: Linares-Barranco, Alejandro**. February-2020 to December-2021. 64.725 €.
3. Neuromorphic Processor Project. Samsung Electronics Co. Ltd. **IP: Linares-Barranco, Alejandro**. 01/05/2015-30/04/2018. 273.000 €.
4. Neuromorphic Processor Project Phase 2. Samsung Electronics Co. Ltd. **IP: Linares-Barranco, Alejandro**. 01/05/2018-01/05/2020. 100.656 €.
5. Desarrollo e Implementación del Hardware y Firmware Necesario para la Automatización de un Sistema de Tinción para Inmunohistoquímica (VitroStainer). Vitro, S.A. Co-IP: Vicente Díaz, Saturnino. 14/07/2021-14/07/2023. 95.000 €.
6. Algoritmo de Planificación Genérico Adaptable a Equipos de Análisis Clínicos Automatizados (VitroPlanner). Vitro, S.A. Co-IP: Vicente Díaz, Saturnino. 14/07/2021-14/07/2023. 81.000 €
7. **Spin-off Companies**: COBER SL. <http://www.t-cober.es/> **Co-founder** in 2014.

C.5. Experience on PhD committees (last 5-years):

- Kyle Madden. February 18th, 2025. "Spiking Neural Networks for Detecting Denial-of-Service Attacks in Networks-on-Chip". Ulster University, UK.



- Álvaro Ayuso Martínez, January 24th, 2025. "Study, Design and Implementation of Neuromorphic Systems through a Spiking Boolean Computing Paradigm". University of Seville. Spain.
- Luis J. Muñoz Molina. July 26th, 2024. "Information density in highly dimensional training datasets". University of Cádiz. Spain.
- Daniel Casanueva Morato. July, 1st, 2024. "Computational Neuromorphic Architectures for Modeling the Hippocampus Formation applied to Robotic Navigation". University of Seville, Spain.
- Antonio Ramirez de Arellano Marrero. May 28th, 2024. "Virus Machines: An Unconventional Computing Paradigm". University of Seville. Spain.
- Pablo López Osorio. May 3rd, 2024. "Diseño e implementación de una red neuromórfica adaptativa para la generación y control de movimiento robótico bioinspirado". University of Cádiz, Spain.
- Fernando M. Quintana Velázquez, December 20th, 2023. "Exploring Learning on Neuromorphic Systems: Towards local and online learning for edge applications". University of Cádiz. Spain.
- Evelina Forno, September 28th, 2023. "Study and implementation of new computational paradigms exploiting neuromorphic hardware architectures". Politecnico di Torino, Italy.
- Alberto Patiño Saucedo, February 10th, 2022. "Deep Spiking Neural Networks for event-driven Neuromorphic Computing". UNIVERSITY OF GUANAJUATO, Mexico.
- Gregor Lenz, July 6th, 2021. "Neuromorphic Algorithms and Hardware for Event-based Processing". Sorbone University, France.
- Marco Monforte. May 26th, 2021. "Trajectory Prediction with Event-Based Cameras for Robotics Applications". IIT - Istituto Italiano di Tecnologia. University of Genova. Italy.
- WANG QINYI, February 24th, 2021. "Space-time Event Clouds-Based Event Processing", NTU Singapore.
- Omar Oubari, December 14th, 2020 "Precise timing and computationally efficient learning in neuromorphic systems". Sorbone University. France.