

Part A. PERSONAL INFORMATION

CV date 4/26/2024

First name	Enrique S.		
Family name	Quintana-Orti		
Gender		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail		URL Web: https://www.upv.es/ficha-personal/enquior	
Open Research and Contributor ID (ORCID)	0000-0002-5454-165X		

A.1. Current position

Position	Professor (Catedrático de Universidad)		
Initial date	5/3/2019 at UPV		
Institution	Universidad Politécnica de Valencia		
Department/Center	Departamento de Informática de Sistemas y Computadores		
Country	Spain	Teleph. number	+34 [REDACTED]
Key words	Parallel computing, computer architecture		

A.2. Previous positions (research activity interruptions, art. 45.2.b)

Period	Position/Institution/Country/Interruption cause
1992-1995	Assistant researcher/ Universidad Politécnica de Valencia/Spain
1995-2000	Assistant professor/Universidad Jaime I/Spain
2000-2009	Associate professor/Universidad Jaime I/Spain
2009-2019	Professor/Universidad Jaime I/Spain

A.4. Education

PhD, Licensed, Graduate	University/Country	Year
Bachelor in Computer Science	Universidad Politécnica de Valencia, Spain	1992
PhD in Computer Science	Universidad Politécnica de Valencia, Spain	1996

Parte B. CV SUMMARY

I am PhD in Computer Science since 1996 by the Polytechnic University of Valencia (UPV) and University Professor in the area of Computer Architecture and Technology at the same university since 2019. Previously I was Professor at the University Jaime I (UJI) from 2009 to 2019.

I have been principal investigator of seven projects of the Plan Nacional de I+D+i continuously from 2002 to 2023. Currently I am principal investigator of the projects PID2020-113656-RB-C02-2 and TED2021-129334B-I00, both from the State Plan for Scientific-Technical Research and its Transfer. I have also been principal investigator in two national research networks.

At the international level, I have participated as principal investigator of the university in four European projects (two FP7 and two H2020), in 6 projects of the National Science Foundation of the USA, one project of the German Research Agency (DFG) and 4 COST networks of the European Union. Currently, I participate as a researcher in four European projects (EU H2020-JTI-EuroHPC-2019-1 955776, EU H2020-JTI-EuroHPC-2019-1 955558, 101070679, 101057457), and I am responsible researcher at UPV of an ITN-MCSA network (EU H2020 MCSA-ITN-2020 956090).

In transfer activities, I have participated in research contracts with the companies Mellanox, Microsoft, ABB Switzerland, PetaPath, Catón SA, Management Solutions, FACSA, Multiscan



Tecnologies, S.L. and QSIMOV Quantum Computing, S.L., with an overall funding received of 150,000 euros plus 184,000 dollars.

At the level of scientific results, I have published 151 papers in indexed journals (102 in the last 10 years, since 2014), in many cases in collaboration with researchers from centers such as The University of Texas at Austin, University of Tennessee at Knoxville, The University of Manchester, Karlsruhe Institute of Technology, Max Planck Institute for Dynamics of Complex Technical Systems, École Polytechnique Fédérale de Lausanne (EPFL), IBM Research Zürich, and Argonne National Laboratory. A good number of these publications have been the result of the supervision of 19 doctoral theses (11 in the last 10 years). After graduation, some of these PhDs were hired by companies and centers such as Google Munich (G. Flegar), CERN (X. Valls), ETH Zürich (T. Smith), Barcelona Supercomputing Center (S. Catalán), DKRZ Hamburg (M. F. Dolz) and Univ. de Valladolid (R. Carratalá).

I am currently an area editor for the journals ACM Trans. on Mathematical Computing and Parallel Computing. In the past I have acted as a guest editor for 4 special issues of the journal Concurrency & Computation: Practice & Experience, a special issue of the Journal of Supercomputing, a special issue of the journal Parallel Computing, and a special issue of the journal Int. J. of High Performance Computing & Appl.

In research management, I was an adjunct collaborator of the State Research Agency from 2017 to 2021. Occasionally, I have been a reviewer of research projects for ANEP since 2006, Agencia Andaluza de Evaluación de la Investigación, Agencia de Evaluación de la Investigación de Castilla y León, and Austrian Research Evaluation Agency. In addition, I was a member of the panels of experts of the National Accreditation program for the ANECA's National Accreditation Program for Full Professors/Catedráticos de Universidad de la ANECA.

I have participated in the program committee of 115 international conferences (96 of them in the last 10 years). I have also participated/participate as organizer in the conferences Supercomputing 2019 (proceedings chair), e-Energy 2023 (publications co-chair) and ACM International Conference on Supercomputing 2020, 2022 and 2023 (publications chair in the three occasions). In the same vein, I have organized Workshops/Symposiums at the ParCo 2011, PPAM 2013, PPOPP 2016, PPAM 2015, PPAM 2017, ISC 2018 and PPSC 2018 conferences.

I have five 6-year research periods (sexenios) recognized by the CNEAI, and I have received awards for my research from the company NVIDIA and the U.S. Agency NASA. I have also received the Euro-PAR 2023 award for my research career.

My lines of research over the years have revolved around high-performance computing and processor architecture-aware optimization of scientific codes. In the last five years, my research work has focused on the optimization of machine learning algorithms and applications. This line currently benefits from public funding from the State Research Agency and the H2020 program of the European Union. It also benefits from projects focused on the application of machine learning technologies funded by the Nuclear Safety Council (Design of fuel loading pattern), the water company FACSA (Study of pollutant dispersion), the company Multiscan Technologies, S.L. (Food screening algorithms), the company DISMUNTEL, S.A.L. (security in enclosed spaces), the company QSIMOV Quantum Computing, S.L. (Alternatives for the acceleration of deep neural network training), and the Junta de Comunidades de Castilla-La Mancha (Aircraft approach assistance).

Parte C. RELEVANT MERITS

C.1. Most important publications in books and journals with "peer review" and in conferences (10 selected publications)

1. "Programming parallel dense matrix factorizations and inversion for new-generation NUMA architectures". S. Catalán, F. D. Igual, J. R. Herrero, R. Rodríguez-Sánchez, E. S. Quintana. J. of Parallel and Distributed Computing, Vol. 175, pp. 51-65, 2023. ISSN: 1532-0626. JCR: 3.8 (JCR 2022) (Q2).



2. "Efficient and portable GEMM-based convolution operators for deep neural network training on multicore processors". S. Barrachina, M. F. Dolz, P. San Juan, E. S. Quintana. *J. of Parallel and Distributed Computing*, Vol. 167, pp. 240-254, 2022. ISSN: 1532-0626. JCR: 3.8 (Q2).
3. "Adaptive precision block-Jacobi for high performance preconditioning in the Ginkgo linear algebra software". G. Flegar, H. Anzt, T. Cojean, E. S. Quintana. *ACM Trans. on Mathematical Software*, Vol. 47(2), pp. 14:1-14:28, 2021. ISSN: 0098-3500. JCR: 2.464 (Q1).
4. "Accelerating distributed deep neural network training with pipelined MPI Allreduce". A. Castelló, E. S. Quintana, J. Duato. *Cluster Computing*, Vol. 24, 3797-3813, 2021. ISSN: 1386-7857. JCR: 2.303 (Q2).
5. "Reformulating the direct convolution for high-performance deep learning inference on ARM processors". S. Barrachina, A. Castelló, M. F. Dolz, T. M. Low, H. Martínez, E. S. Quintana, U. Sridhar, A. E. Tomás. *J. Systems Architecture*, Vol. 135, pp. 102806, 2023. ISSN: 1383-7621. JCR: 4.5 (JCR 2022) (Q1).
6. "Analyzing the impact of the MPI Allreduce in distributed training of convolutional neural networks". A. Castelló, M. Catalán, M. F. Dolz, E. S. Quintana, J. Duato. *Computing*, Vol. 105, pp. 1101-1119, 2023. ISSN: 1436-5057. JCR: 3.7 (JCR 2022) (Q2).
7. "Efficient update of determinants for many-electron wave function overlaps". P. Alonso, D. Davidovic, M. Sapunar, J. R. Herrero, E. S. Quintana. *Computer Physics Communications*, Vol. 258, 107521, 2021. JCR: 3.627 (JCR 2019) (Q1).
8. "Analysis of threading libraries for high performance computing". A. Castelló, R. Mayo, S. Seo, P. Balaji, E. S. Quintana, A. Peña. *IEEE Trans. on Computers*, Vol. 69(9), pp. 1279-1292, 2020. JCR: 2.711 (JCR 2019) (Q2).
9. "FloatX: A C++ library for customized floating-point arithmetic". G. Flegar, F. Scheidegger, V. Novakovic, G. Mariani, A. E. Tomás, A. C. M. Malossi, E. S. Quintana. *ACM Trans. on Mathematical Software*, Vol. 45(4), 40:1-40:23, 2019. JCR: 2.043 (Q1).
10. "Fine-grained bit-flip protection for relaxation methods". H. Anzt, J. Dongarra, E. S. Quintana. *J. of Computational Science*, Vol. 36, pp. 1-11, 2019. JCR: 2.644 (Q2).

The full list of publications can be found here: <http://www.disca.upv.es/enquior/lista.html>.

C.2. Projects or research lines in which you have participated

1. Plan de Transición Ecológica y Transición Digital TED2021-129334B-I00 "Aceleración de algoritmos de aprendizaje automático en microcontroladores y microprocesadores de consumo ultrareducido". IPs: E. S. Quintana, M. F. Dolz. Duration: 12/2022-11/2024. Financing: 114.195 euros.
2. EU H2020 MCSA-ITN-2020 956090 "APROPOS. Approximate Computing for Power and Energy Optimisation". IP: J. Nurmi (Tampere Univ.); IP en UPV: E. S. Quintana. Duration: 11/2020-10/2023. Financing: 4.080.122 euros (250.904 euros en UPV).
3. EU HORIZON-CL4-2021-TWIN-TRANSITION-01-03 101057457 "Metamorph. Made-to-measure micromachining with laser beams tailored in amplitude and phase". IP: (Fraunhofer ILT); IP en UPV: V. Naranjo. Duration: 1/9/2022-31/08/2026
4. EU HORIZON-CL4-2021-DIGITAL-EMERGING-01 101070679 "Ultra-Energy Efficient and Secure Neuromorphic Sensing And Processing At The Endpoint". IP: S. Haskins (Ikerland); IP en UPV: C. Hernández. Duration: 01/2023-9/25. Financing: 8.882.000 euros (485.812 euros en UPV).
5. EU H2020-JTI-EuroHPC-2019-1 955558 "eFLOWS4HPC. Enabling Dynamic and Intelligent Workflows In The Future EuroHPC ecosystem". IP: R. Badia (BSC); IP en UPV: J. Flich. Duration: 1/2021-3/2024. Financing: 3.576.656 euros.
6. EU H2020-JTI-EuroHPC-2019-1 955776 "RED-SEA. Towards Extreme Scale Technologies and Applications". IP: E. Walker (Atos); IP en UPV: M. E. Gómez. Duration: 3/2021-3/2024. Financing: 3.996.855 euros.
7. Plan Nacional I+D+I PID2020-113656RB-C22, "Computación y comunicaciones de altas prestaciones conscientes del consumo energético. Aplicaciones al aprendizaje profundo



- computacional - UPV". IP: E. S. Quintana. Duration: 9/2021-8/2024. Financing: 181.500 euros.
8. Plan Nacional I+D+I TIN2017-82972-R "TACCERE. Técnicas algorítmicas para computación de alto rendimiento consciente del consumo energético y resistente a errores". IP: E. S. Quintana. Duration: 1/2018-12/2020. Financing: 217.800 euros.
 9. EU H2020 FET-PROACTIVE 732631. "OPRECOMP. Open Transprecision Computing". IP: C. Bekas (IBM Research Lab. Zürich); IP en UJI: E. S. Quintana (hasta el 4/3/2019). Duration: 1/2017-12/2020. Financing: 5.990.510 euros (491.250 euros en UJI).
 10. EU H2020 FET-HPC 671602 "INTERTWinE. Programming models interoperability towards Exascale". IP: M. Bull (Universidad de Edinburgo); IP en UJI: E. S. Quintana. Duration: 10/2010-9/2018. Financing: 3.861.204 euros (396.750 euros en UJI)

The full list of publications can be found here: <http://www.disca.upv.es/enquior/proyectos.html>.

C.3. Participation in technology/knowledge transfer activities and exploitation of results

1. "Tratamiento y automatización de la obtención de métricas de calidad y configuraciones óptimas en el flujo de proceso MVS". PI: E. S. Quintana. Supported by: Multiscan Technologies, S.L. Duration: 5/2023-4/2024. Financing: 9.982 euros.
2. "Estudio de técnicas alternativas para la aceleración del entrenamiento de redes neuronales profundas". PI: E. S. Quintana. Supported by: QSIMOV Quantum Computing, S.L. Duration: 12/22-12/23). Financing: 33.600 euros.
3. "Análisis de la eficiencia de cálculo y Comunicaciones y propuesta de mejoras en el flujo del proceso MVS sobre plataforma Windows". PI: E. S. Quintana. Supported by: Multiscan Technologies, S.L. Duration: 1/2022-6/2022. Financing: 5.717 euros.
4. "Mantenimiento y puesta en marcha de un centro de desarrollo y transferencia de tecnologías de fabricación avanzada (II)". PI: J. E. Capilla. Supported by: Agencia Valenciana de la Innovación. 1/2010-1/2021. Financiación: > 200.000 euros.
5. "Mantenimiento y puesta en marcha de un centro de desarrollo y transferencia de tecnologías de fabricación avanzada (I)". PI: J. E. Capilla. Supported by: Agencia Valenciana de la Innovación. 3/2019-1/2020. Financing: > 200.000 euros.
6. "Parallel ILU-based equation solver for real-valued sparse SPD-matrices originating from a magnetostatic FEM-solver". PI: J. I. Aliaga. Supported by: ABB Suiza. Duration: 9/2014-10/2014. Financing: 15.000 euros.
7. "rCUDA. Accelerating the development in the areas of scheduling management". PI: R. A. Mayo. Supported by: Mellanox Technologies, Inc. Duration: 7/2013-6/2015. Financing: 100.000 dólares USA.
8. "MONICA. Sistema de monitorización y control con gestión inteligente de la eficiencia energética para centros de procesos de datos ultradensos orientados a HPC y cloud computing" PI: R. A. Mayo. Supported by: Catón Sistemas Alternativos. Duration: 1/2012-12/2013. Financing: 41.300 euros.