Curriculum Vitae

Jose E. Roman

D. Sistemes Informàtics i Computació
Universitat Politècnica de València
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Personal Info

Citizenship: Spanish.

Born March 10, 1971 in Alcoi.

Research Interests

Numerical solution of large-scale sparse eigenvalue problems.

Software engineering for large-scale scientific computing.

General: numerical linear algebra, PDE's, high performance computing.

Education

Llicenciat en Informàtica (5-year degree), Universitat Politècnica de València, March 1996.

Doctor en Informàtica (PhD), Universitat Politècnica de València, February 2003.

Thesis title: "Software portable, escalable y extensible para la resolución de problemas de valores propios dispersos de gran dimensión". Advisors: V. Hernández, V. Vidal. Defense committee: A. Vidal, L. Nuño, E. L. Zapata, R. Ralha, T. Drummond

Positions

Becari Especialització, Universitat Politècnica de València, 2/1995–12/1996.

Becari FPI (Generalitat Valenciana), Universitat Politècnica de València, 1/1997–10/2000.

Ajudant d'Escola Universitària, Universitat Politècnica de València, 10/2000–5/2003.

Titular d'Escola Universitària, Universitat Politècnica de València, 5/2003–7/2008.

Titular d'Universitat (Associate Professor), Universitat Politècnica de València, 7/2008–3/2019.

Catedràtic d'Universitat (Full Professor), Universitat Politècnica de València, since 3/2019.

Research Visits

Mathematics and Computer Science Division, Argonne National Laboratory, Jul–Sep 2001.

Computational Research Division, Lawrence Berkeley National Laboratory, Oct 2001.

MATHICSE, Ecole Polytechnique Fédérale de Lausanne, Feb–Apr 2013 (host D. Kressner).

Research Grants

"Técnicas de aceleración para algoritmos de cálculo de valores propios en SLEPc," Generalitat Valenciana, GV06-091, Role: Principal Investigator, 2006-2007.

"Numerical methods for spectral computations: development and implementation in parallel computers," MEC (Acción Integrada), HP2006-0004, Role: Co-Principal Investigator, 2007-2008.

"Métodos avanzados y técnicas computacionales novedosas para la resolución numérica de problemas de valores propios de gran dimensión," MICINN (PNIDI), TIN2009-07519, Role: Principal

Investigator, 2010-2012.

"Técnicas avanzadas de computación paralela para la gestión dinámica de recursos en redes de comunicaciones móviles," UPV, PAID-05-10-0200, Role: Principal Investigator, 2011.

"De plataformas paralelas tradicionales a entornos de computación GPU y *cloud*—un caso de estudio de computación espectral," MICINN (PNIDI-Programa de Internacionalización), AIC10-D-000600, Role: Co-Principal Investigator, 2011.

"Extending the SLEPc library for matrix polynomials, matrix functions and matrix equations in emerging computing platforms," MEC (PEICTI), TIN2013-41049-P, Role: Principal Investigator, 2014-2016.

"Highly scalable eigensolvers in the context of the SLEPc library," Agencia Estatal de Investigación, TIN2016-75985-P, Role: Principal Investigator, 2017-2019.

"Parallel algorithms and software for algebraic methods in data analytics," Agencia Estatal de Investigación, PID2019-107379RB-I00, Role: Principal Investigator, 2020-2022.

PhD Supervision

Andrés Tomás, *Implementación paralela de métodos de Krylov con reinicio para problemas de valores propios y singulares*, together with V. Hernández. U. Politècnica de València, May 2009.

Eloy Romero, *Parallel implementation of Davidson-type methods for large-scale eigenvalue problems*. U. Politècnica de València, March 2012.

Carlos Campos, *Algoritmos de altas prestaciones para el cálculo de la descomposición en valores singulares y su aplicación a la reducción de modelos de sistemas lineales de control*, together with R. Ralha. U. Politècnica de València, December 2014.

David Guerrero, *Algoritmos paralelos para la reducción de sistemas lineales de control estables*. U. Politècnica de València, December 2015.

Carmen Campos, *Implementación paralela de métodos iterativos para la resolución de problemas polinómicos de valores propios*. U. Politècnica de València, July 2017.

Alejandro Lamas Daviña, *Dense and sparse parallel linear algebra algorithms on graphics processing units*. U. Politècnica de València, October 2018.

Journal Articles

[1] V. Hernandez and J. E. Roman. High-quality computational tools for linear-algebra problems in FEM electromagnetic simulation. *IEEE Antennas Propag.*, 46(6):110–119, 2004. DOI

[2] V. Hernandez, J. E. Roman, and V. Vidal. SLEPc: A scalable and flexible toolkit for the solution of eigenvalue problems. *ACM Trans. Math. Software*, 31(3):351–362, 2005. DOI

[3] V. Hernández, J. E. Román, and A. Tomás. Parallel Arnoldi eigensolvers with enhanced scalability via global communications rearrangement. *Parallel Comput.*, 33(7-8):521–540, 2007. DOI

[4] V. Hernández, J. E. Román, and A. Tomás. A robust and efficient parallel SVD solver based on restarted Lanczos bidiagonalization. *Electron. Trans. Numer. Anal.*, 31:68–85, 2008. URL

[5] D. Gilbert, J. E. Roman, W. J. Garland, and W. F. S. Poehlman. Simulating control rod and fuel assembly motion using moving meshes. *Ann. Nucl. Energy*, 35(2):291–303, 2008. DOI

[6] G. Verdú, D. Ginestar, J. Román, and V. Vidal. 3D alpha modes of a nuclear power reactor. *J. Nucl. Sci. Technol.*, 47(5):501–514, 2010. DOI

[7] D. Calabuig, S. Gimenez, J. E. Roman, and J. F. Monserrat. Fast Hopfield neural networks using subspace projections. *Neurocomputing*, 73(10-12):1794–1800, 2010. DOI

[8] J. E. Roman, M. Kammerer, F. Merz, and F. Jenko. Fast eigenvalue calculations in a massively parallel plasma turbulence code. *Parallel Comput.*, 36(5-6):339–358, 2010. DOI

[9] E. Ramos, J. E. Roman, S. Cardona-Serra, and J. M. Clemente-Juan. Parallel implementation of the MAGPACK package for the analysis of high-nuclearity spin clusters. *Comput. Phys. Commun.*, 181(12):1929–1940, 2010. DOI

[10] M. Schauer, S. Langer, J. E. Roman, and E. S. Quintana-Ortí. Large scale simulation of wave propagation in soils interacting with structures using FEM and SBFEM. *J. Comput. Acoust.*, 19(1):75–93, 2011. DOI

[11] E. Romero and J. E. Roman. Computing subdominant unstable modes of turbulent plasma with a parallel Jacobi-Davidson eigensolver. *Concur. Comp.-Pract. E.*, 23(17):2179–2191, 2011. DOI

[12] F. Merz, C. Kowitz, E. Romero, J. E. Roman, and F. Jenko. Multi-dimensional gyrokinetic parameter studies based on eigenvalue computations. *Comput. Phys. Commun.*, 183(4):922–930, 2012. DOI

[13] C. Campos and J. E. Roman. Strategies for spectrum slicing based on restarted Lanczos methods. *Numer. Algorithms*, 60(2):279–295, 2012. DOI

[14] M. Schauer, J. E. Roman, E. S. Quintana-Ortí, and S. Langer. Parallel computation of 3D soil-structure interaction in time domain with a coupled FEM/SBFEM approach. *J. Sci. Comput.*, 52(2):446–467, 2012. DOI

[15] J. E. Roman, P. B. Vasconcelos, and A. L. Nunes. Eigenvalue computations in the context of data-sparse approximations of integral operators. *J. Comput. Appl. Math.*, 237(1):171–181, 2013. DOI

[16] T. D. Young, E. Romero, and J. E. Roman. Parallel finite element density functional computations exploiting grid refinement and subspace recycling. *Comput. Phys. Commun.*, 184(1):66–72, 2013. DOI

[17] P. B. Vasconcelos, F. D. d'Almeida, and J. E. Roman. A Jacobi-Davidson type method with a correction equation tailored for integral operators. *Numer. Algorithms*, 64(1):85–103, 2013. DOI

[18] E. Romero and J. E. Roman. A parallel implementation of Davidson methods for large-scale eigenvalue problems in SLEPc. *ACM Trans. Math. Software*, 40(2):13:1–13:29, 2014. DOI

[19] D. Kressner and J. E. Roman. Memory-efficient Arnoldi algorithms for linearizations of matrix polynomials in Chebyshev basis. *Numer. Linear Algebra Appl.*, 21(4):569–588, 2014. DOI

[20] E. Ramos, J. E. Roman, A. Abarca, R. Miró, and J. A. Bermejo. Control rod drop transient analysis with the coupled parallel code pCTF-PARCSv2.7. *Ann. Nucl. Energy*, 87(2):308–317, 2016. DOI

[21] A. Bernal, J. E. Roman, R. Miró, D. Ginestar, and G. Verdú. Development of a finite volume inter-cell polynomial expansion method for the neutron diffusion equation. *J. Nucl. Sci. Technol.*, 53(8):1212–1223, 2016. DOI

[22] C. Campos and J. E. Roman. Restarted Q-Arnoldi-type methods exploiting symmetry in quadratic eigenvalue problems. *BIT Numer. Math.*, 56(4):1213–1236, 2016. DOI

[23] I. V. Shevchenko, P. S. Berloff, D. Guerrero-López, and J. E. Roman. On low-frequency variability of the midlatitude ocean gyres. *J. Fluid Mech.*, 795:423–442, 2016. DOI

[24] C. Campos and J. E. Roman. Parallel Krylov solvers for the polynomial eigenvalue problem in SLEPc. *SIAM J. Sci. Comput.*, 38(5):S385–S411, 2016. DOI

[25] C. Campos and J. E. Roman. Parallel iterative refinement in polynomial eigenvalue problems. *Numer. Linear Algebra Appl.*, 23(4):730–745, 2016. DOI

[26] A. Bernal, J. E. Roman, R. Miró, and G. Verdú. Assembly discontinuity factors for the neutron diffusion equation discretized with the finite volume method. Application to BWR. *Ann. Nucl. Energy*, 97:76–85, 2016. DOI

[27] O. Vega-Gisbert, J. E. Roman, and J. M. Squyres. Design and implementation of Java bindings in Open MPI. *Parallel Comput.*, 59:1–20, 2016. DOI

[28] A. Lamas Daviña, E. Ramos, and J. E. Roman. Optimized analysis of isotropic high-nuclearity spin clusters with GPU acceleration. *Comput. Phys. Commun.*, 209:70–78, 2016. DOI

[29] E. Ramos, J. E. Roman, A. Abarca, R. Miró, J. A. Bermejo, A. Ortego, and J. M. Posada. Verification of the parallel pin-wise core simulator pCTF/PARCSv3.2 in operational control rod drop transient scenarios. *Nucl. Sci. Eng.*, 187(3):254–267, 2017. DOI

[30] Á. Bernal, A. Hébert, J. E. Roman, R. Miró, and G. Verdú. A Krylov-Schur solution of the eigenvalue problem for the neutron diffusion equation discretized with the Raviart-Thomas method. *J. Nucl. Sci. Technol.*, 54(10):1085–1094, 2017. DOI

[31] Á. Bernal, J. E. Roman, R. Miró, and G. Verdú. Multigroup neutron diffusion equation with the finite volume method in reactors using MOX fuels. *J. Nucl. Sci. Technol.*, 54(11):1251–1260, 2017. DOI

[32] A. Lamas Daviña and J. E. Roman. MPI-CUDA parallel linear solvers for block-tridiagonal matrices in the context of SLEPc's eigensolvers. *Parallel Comput.*, 74:118–135, 2018. DOI

[33] A. Bernal, J. E. Roman, R. Miró, and G. Verdú. Calculation of multiple eigenvalues of the neutron diffusion equation discretized with a parallelized finite volume method. *Prog. Nucl. Energy*, 105:271–278, 2018. DOI

[34] M. Keçeli, F. Corsetti, C. Campos, J. E. Roman, H. Zhang, Á. Vázquez-Mayagoitia, P. Zapol, and A. F. Wagner. SIESTA-SIPs: Massively parallel spectrum-slicing eigensolver for an ab initio molecular dynamics package. *J. Comput. Chem.*, 39(22):1806–1814, 2018. DOI

[35] J. L. Steward, J. E. Roman, A. Lamas Daviña, and A. Aksoy. Parallel direct solution of the covariance-localized ensemble square-root Kalman filter equations with matrix functions. *Mon. Weather Rev.*, 146(9):2819–2836, 2018. DOI

[36] B. J. Faber, M. J. Pueschel, P. W. Terry, C. C. Hegna, and J. E. Roman. Stellarator microinstabilities and turbulence at low magnetic shear. *J. Plasma Phys.*, 84(5):905840503, 2018. DOI

[37] S. Morató, Á. Bernal, R. Miró, J. E. Roman, and G. Verdú. Calculation of λ modes of the multi-group neutron transport equation using the discrete ordinates and Finite Difference Method. *Ann. Nucl. Energy*, 137:107077, 2020. DOI

[38] J. C. Araujo C., C. Campos, C. Engström, and J. E. Roman. Computation of scattering resonances in absorptive and dispersive media with applications to metal-dielectric nano-structures. *J. Comput. Phys.*, 407:109220, 2020. DOI

[39] C. Campos and J. E. Roman. A polynomial Jacobi–Davidson solver with support for non-monomial bases and deflation. *BIT Numer. Math.*, 60(2):295–318, 2020. DOI

[40] C. Campos and J. E. Roman. Inertia-based spectrum slicing for symmetric quadratic eigenvalue problems. *Numer. Linear Algebra Appl.*, 27(4):e2293, 2020. DOI

[41] V. W. Yu, C. Campos, W. Dawson, A. García, V. Havu, B. Hourahine, W. P. Huhn, M. Jacquelin, W. Jia, M. Keçeli, R. Laasner, Y. Li, L. Lin, J. Lu, J. Moussa, J. E. Roman, Á. Vázquez-Mayagoitia, C. Yang, and V. Blum. ELSI — an open infrastructure for electronic structure solvers. *Comput. Phys. Commun.*, 256:107459, 2020. DOI

[42] G. Demésy, A. Nicolet, B. Gralak, C. Geuzaine, C. Campos, and J. E. Roman. Non-linear eigenvalue problems with GetDP and SLEPc: Eigenmode computations of frequency-dispersive photonic open structures. *Comput. Phys. Commun.*, 257:107509, 2020. DOI

[43] Z. Dalvand, M. Hajarian, and J. E. Roman. An extension of the Cayley transform method for a parameterized generalized inverse eigenvalue problem. *Numer. Linear Algebra Appl.*, 27(6):e2327, 2020. DOI

[44] X. Liao, S. Li, Y. Lu, and J. E. Roman. A parallel structured divide-and-conquer algorithm for symmetric tridiagonal eigenvalue problems. *IEEE Trans. Parall. Distr.*, 32(2):367–378, 2021. DOI

[45] P. Jolivet, J. E. Roman, and S. Zampini. KSPHPDDM and PCHPDDM: Extending PETSc with advanced Krylov methods and robust multilevel overlapping Schwarz preconditioners. *Comput. Math. Appl.*, 84:277–295, 2021. DOI

[46] C. Campos and J. E. Roman. NEP: a module for the parallel solution of nonlinear eigenvalue problems in SLEPc. *ACM Trans. Math. Software*, 47(3):23:1–23:29, 2021. DOI

Refereed Proceeding Papers

[1] V. Hernández, A. Vidal, I. Blanquer, J. E. Román, S. Flich, J. Muñoz-Cobo, G. Verdú, X. Sancho, A. Escrivá, J. Serra, and A. Gómez. A PVM parallel implementation of the nuclear transient analysis code TRAC-BF1. In L. Vázquez, F. Tirado, and I. Martín, editors, *Supercomputation in Nonlinear and Disordered Systems: Algorithms, Applications and Architectures*, pages 310–313. World Scientific, 1997. DOI

[2] D. Guerrero, V. Hernández, J. E. Roman, and A. M. Vidal. Parallel algorithms for the Cholesky factor of generalized Lyapunov equations. *IFAC Proceedings Volumes*, 31(4):201–206, 1998. 5th IFAC Workshop on Algorithms & Architectures for Real Time Control (AARTC'98), Cancun, Mexico, 15-17 April 1998. DOI

[3] V. Hernández, J. E. Román, A. M. Vidal, and V. Vidal. Calculation of lambda modes of a nuclear reactor: a parallel implementation using the implicitly restarted Arnoldi method. In J. M. L. M. Palma, J. Dongarra, and V. Hernández, editors, *Third International Conference for Vector and Parallel Processing–VECPAR'98*, volume 1573 of *Lect. Notes Comp. Sci.*, pages 43–57. Springer, 1999. DOI

[4] E. Arias, V. Hernández, J. E. Román, A. M. Vidal, R. Torres, I. Montón, F. Chinesta, A. Poitou, and F. Meslin. HIPERPLAST: An HPCN simulator for reinforced thermoplastics injection processes. In E. H. D'Hollander, G. R. Joubert, F. J. Peters, and H. J. Sips, editors, *Parallel Computing: Fundamentals and Applications*, pages 63–70. Imperial College Press, 2000. DOI

[5] M. Caballer, D. Guerrero, V. Hernandez, J. E. Roman, M. Alcañiz, J. A. Gil, and J. M. Rubio. High performance virtual reality distributed electronic commerce: Application for the furniture and ceramics industries. In *Proceedings of the Sixth International Conference on Information Visualisation*, pages 516–521. IEEE Computer Society, 2002. DOI

[6] D. Guerrero, V. Hernández, and J. E. Román. Parallel SLICOT model reduction routines: The Cholesky factor of Grammians. *IFAC Proceedings Volumes*, 35(1):327–332, 2002. 15th IFAC World Congress. DOI

[7] M. Caballer, D. Guerrero, V. Hernández, and J. E. Román. A parallel rendering algorithm based on hierarchical radiosity. In J. M. L. M. Palma, J. Dongarra, V. Hernández, and A. A. de Sousa, editors, *High Performance Computing for Computational Science–VECPAR 2002*, volume 2565 of *Lect. Notes Comp. Sci.*, pages 523–536. Springer, 2003. DOI

[8] V. Hernández, J. E. Román, and V. Vidal. SLEPc: Scalable Library for Eigenvalue Problem Computations. In J. M. L. M. Palma, J. Dongarra, V. Hernández, and A. A. de Sousa, editors, *High Performance Computing for Computational Science–VECPAR 2002*, volume 2565 of *Lect. Notes Comp. Sci.*, pages 377–391. Springer, 2003. DOI

[9] M. Caballer, V. Hernández, and J. E. Román. A grid-enabled scene rendering application. In M. Bubak, G. D. van Albada, P. M. A. Sloot, and J. Dongarra, editors, *International Conference on Computational Science*, volume 3038 of *Lect. Notes Comp. Sci.*, pages 54–57. Springer, 2004. DOI

[10] L. A. Drummond, V. Hernandez, O. Marques, J. E. Roman, and V. Vidal. A survey of high-quality computational libraries and their impact in science and engineering applications. In M. J. Daydé, J. Dongarra, V. Hernandez, and J. M. L. M. Palma, editors, *High Performance Computing for Computational Science–VECPAR 2004*, volume 3402 of *Lect. Notes Comp. Sci.*, pages 37–50. Springer, 2005. DOI

[11] V. Hernández, J. E. Román, and A. Tomás. A parallel variant of the Gram-Schmidt process with reorthogonalization. In G. R. Joubert, W. E. Nagel, F. J. Peters, O. G. Plata, P. Tirado, and E. L. Zapata, editors, *Parallel Computing: Current & Future Issues of High-End Computing*, volume 33 of *John von Neumann Institute for Computing Series*, pages 221–228. Central Institute for Applied Mathematics, Jülich, Germany, 2006. URL

[12] V. Hernández, J. E. Román, and A. Tomás. Evaluation of several variants of explicitly restarted Lanczos eigensolvers and their parallel implementations. In M. J. Daydé, J. M. L. M. Palma, A. L. G. A. Coutinho, E. Pacitti, and J. C. Lopes, editors, *High Performance Computing for Computational Science–VECPAR 2006*, volume 4395 of *Lect. Notes Comp. Sci.*, pages 403–416. Springer, 2007. DOI

[13] V. Hernández, J. E. Roman, and A. Tomás. A parallel Krylov-Schur implementation for large Hermitian and non-Hermitian eigenproblems. *PAMM*, 7(1):2020083–2020084, 2007. DOI

[14] J. E. Roman. Recent additions to SLEPc, the Scalable Library for Eigenvalue Problem computations. *PAMM*, 7(1):1141703–1141704, 2007. DOI

[15] P. B. Vasconcelos, O. Marques, and J. E. Román. Parallel eigensolvers for a discretized radiative transfer problem. In J. M. L. M. Palma, P. Amestoy, M. J. Daydé, M. Mattoso, and J. C. Lopes, editors, *High Performance Computing for Computational Science–VECPAR 2008*, volume 5336 of *Lect. Notes Comp. Sci.*, pages 336–348. Springer, 2008. DOI

[16] E. Romero and J. E. Roman. A parallel implementation of the trace minimization eigensolver. In J. M. L. M. Palma, P. Amestoy, M. J. Daydé, M. Mattoso, and J. C. Lopes, editors, *High Performance Computing for Computational Science–VECPAR 2008*, volume 5336 of *Lect. Notes Comp. Sci.*, pages 255–268. Springer, 2008. DOI

[17] T. D. Young, E. Romero, and J. E. Roman. Finite element solution of the stationary Schrödinger equation using standard computational tools. In *Proceedings of the International Conference on Computational and Mathematical Methods in Science and Engineering*, pages 1140–1150, 2009.

[18] P. B. Vasconcelos, O. Marques, and J. E. Román. High-performance computing for spectral approximations. In C. Constanda and M. E. Pérez, editors, *Integral Methods in Science and Engineering, Volume 2: Computational Methods–IMSE 2008*, pages 351–360. Birkhaüser, 2010. DOI

[19] E. Romero and J. E. Román. A parallel implementation of the Davidson method for generalized eigenproblems. In B. Chapman, F. Desprez, G. R. Joubert, A. Lichnewsky, F. Peters, and T. Priol, editors, *Parallel Computing: From Multicores and GPU's to Petascale*, volume 19 of *Advances in Parallel Computing*, pages 133–140. IOS Press, 2010. DOI

[20] E. Romero and J. E. Roman. A parallel implementation of the Jacobi-Davidson eigensolver and its application in a plasma turbulence code. In P. D'Ambra, M. Guarracino, and D. Talia, editors, *Euro-Par 2010, Part II*, volume 6272 of *Lect. Notes Comp. Sci.*, pages 101–112. Springer, 2010. DOI

[21] E. Romero, M. B. Cruz, J. E. Roman, and P. B. Vasconcelos. A parallel implementation of the Jacobi-Davidson eigensolver for unsymmetric matrices. In J. M. L. M. Palma, M. Daydé, O. Marques, and J. C. Lopes, editors, *High Performance Computing for Computational Science–VECPAR 2010*, volume 6449 of *Lect. Notes Comp. Sci.*, pages 380–393. Springer, 2011. DOI

[22] J. E. Roman and P. B. Vasconcelos. Harnessing GPU power from high-level libraries: eigenvalues of integral operators with SLEPc. In *International Conference on Computational Science–ICCS 2013*, volume 18 of *Procedia Comp. Sci.*, pages 2591–2594. Elsevier, 2013. DOI

[23] O. Vega-Gisbert, J. E. Roman, S. Groß, and J. M. Squyres. Towards the availability of Java bindings in Open MPI. In *Proceedings of the 20th European MPI Users' Group Meeting*, EuroMPI '13, pages 141–142. ACM, 2013. DOI

[24] E. Ramos, A. Abarca, J. E. Roman, and R. Miró. A parallelization approach to the COBRA-TF thermal-hydraulic subchannel code. In *SNA + MC 2013 - Joint International Conference on Supercomputing in Nuclear Applications + Monte Carlo*, page 04107, 2014. DOI

[25] D. Guerrero-Lopez and J. E. Roman. Improving accuracy of parallel SLICOT model reduction routines for stable systems. In *Proceedings of the 23rd Mediterranean Conference on Control and Automation (MED 2015)*, pages 398–403. IEEE, 2015. DOI

[26] A. Lamas Daviña and J. E. Roman. GPU implementation of Krylov solvers for block-tridiagonal eigenvalue problems. In R. Wyrzykowski et al., editors, *Parallel Processing and Applied Mathematics–PPAM 2015, Part I*, volume 9573 of *Lect. Notes Comp. Sci.*, pages 182–191. Springer, 2016. DOI

[27] Y. Maeda, T. Sakurai, J. Charles, M. Povolotskyi, G. Klimeck, and J. E. Roman. Numerical integral eigensolver for a ring region on the complex plane. In T. Sakurai et al., eds., *Eigenvalue Problems: Algorithms, Software and Applications in Petascale Computing: EPASA 2015, Tsukuba, Japan, 2015*, volume 117 of *Lect. Notes Comp. Sci. Eng.*, pages 19–30. Springer, 2017. DOI

[28] A. Lamas Daviña, X. Cartoixà, and J. E. Roman. Scalable block-tridiagonal eigensolvers in the context of electronic structure calculations. In S. Bassini et al., editors, *Parallel Computing is Everywhere*, volume 32 of *Advances in Parallel Computing*, pages 117–126. IOS Press, 2018. DOI

[29] C. Campos and J. E. Roman. Two-sided methods for the nonlinear eigenvalue problem. In R. Gallego and M. Mateos, editors, *XXVI Congreso de Ecuaciones Diferenciales y Aplicaciones, XVI Congreso de Matemática Aplicada*, pages 97–104. U. Oviedo, 2021. URL

Lecture Notes

[1] J. E. Roman, J. M. Alonso, F. Alvarruiz, I. Blanquer, D. Guerrero, J. Ibañez and E. Ramos. Ejercicios de Programación Paralela con OpenMP y MPI. Editorial UPV, 2018.

Teaching Undergrad.

UPV: Computación numérica 2000–2009; Algoritmos numéricos 2003–2011; Computación paralela 2012–; Computación científica 2013–

Teaching Graduate

UPV: Tecnología de la programación paralela 2006–2016; Gestión y visualización de datos en computación científica 2006–2016; Conceptos y métodos de la computación paralela 2019–

CUJAE (Cuba): graduate course 'Computación de altas prestaciones en problemas estáticos y dinámicos de gran dimensión', Jun 2004.

U. Autónoma de Barcelona: seminar on 'Introduction to PETSc programming' in MSc program 'Ciencia e Ingeniería Computacional', Feb 2010 and Feb 2011.

Umeå U.: PhD course 'High Performance Computing II', organized by B. Kågström, Mar 2014.

U. Autónoma de Madrid: seminar on 'Parallel computing and programming' in MSc program on 'Theoretical Chemistry and Computational Modelling', Sep 2019.

Invited Talks

The Mathematics of Chemical Reactivity, Castro Urdiales (Spain), Jun 2009.

Physical and Mathematical Challenges in Light of ITER, Marseille, Oct 2009.

Barcelona Supercomputing Center, seminar on 'Parallel Simulations in the Network', Zaragoza, Nov 2010.

Numerical Solution of PDE Eigenvalue Problems, Oberwolfach, Nov 2013.

NLAHPC, Numerical Linear Algebra and High Perf. Computing, Hsinchu (Taiwan), Dec 2013.

EPASA2014, Eigenvalue Problems: Algorithms, Software and Applications, in Petascale Computing, Tsukuba (Japan), Feb 2014.

RES Engineering Seminar 2014, Barcelona, Sep 2014.

Celebrating 20 Years of Computational Science with PETSc, Argonne, IL, Jun 2015.

10th RES Users Conference, León, Sep 2016.

MACUMB: Massive Computation for Ultrafast Molecular Breaking, Madrid, May 2017.

EPASA2018, Eigenvalue Problems: Algorithms, Software and Applications, in Petascale Computing, Tsukuba (Japan), Mar 2018.

Advanced theoretical and numerical methods for waves in structured media, Paris, Mar 2018.

ATAT 2018: Advanced Topics and Auto Tuning in High-Performance Scientific Computing, Tainan (Taiwan), Mar 2018.

SYMCOMP 2019: 4th Int. Conf. on Numerical and Symbolic Computation: Developments and Applications, Porto, Apr 2019.

Jornadas ALAMA 2019 (Álgebra Lineal, Análisis Matricial y Aplicaciones), Valencia, Jun 2019.

Professional Service

Journal referee: ACM Trans. Math. Softw., SIAM J. Sci. Comput., Parallel Comput., Numer. Linear Algebra Appl., BIT Numer. Math., J. Comput. Phys., Comput. Phys. Commun., Comput. Math. Appl., Calcolo, Int. J. High Perform. C., J. Supercomput., Appl. Math. Comput., IEEE T. Parall. Distrib. Sys., IEEE T. Pattern Anal., Adv. Eng. Softw., Sci. Comput. Program., Comput. Math. Meth., Comput. Mech., Springer Plus. publons

Conference referee: Euro-Par 2005, 2014, VECPAR 2004, 2006, 2008, PARA 2008, ICCS 2018.

Programme Committee member: Parallel Matrix Algorithms and Applications (PMAA), 2008, 2010, 2012, 2014, 2016, 2018, 2020; HPC Asia 2018, 2019, 2020.

Co-organizer: EPSA 2007 (*Eigenvalue Problems: Software and Applications*), Porto, June 2007. Organizing Committee member: VECPAR 2004, AARTC 2000.

Thesis committee member: E. Arias (2003, València), A. Martín (2010, Castelló), M. Baboulin [Habil.] (2012, Paris), M. Trindade (2017, Porto), A. Jamal (2017, Paris), J. A. González Pizarro (2018, Madrid)

Member of the Users Committee of the Spanish Supercomputing Network (CURES), 2017-2019

Software

SLEPc: the Scalable Library for Eigenvalue Problem Computations (together with C. Campos, E. Romero and A. Tomás), http://slepc.upv.es.