

Curriculum Vitae

Jose E. Roman

D. Sistemes Informàtics i Computació
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Education Llicenciat en Informàtica, Universitat Politècnica de València, March 1996.
Doctor en Informàtica (PhD), Universitat Politècnica de València, February 2003.
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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.
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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, since 7/2008.
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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.
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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.

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**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.
- [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.
- [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.
- [4] 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.
- [5] 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.
- [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.
- [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.
- [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.
- [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.
- [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.
- [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.
- [12] F. Merz, C. Kowitz, E. Romero, J. E. Roman, and F. Jenko. Multi-dimensional gyrokinetic parameter studies based on eigenvalues computations. *Comput. Phys. Commun.*, 183(4):922–930, 2012.
- [13] C. Campos and J. E. Roman. Strategies for spectrum slicing based on restarted Lanczos methods. *Numer. Algorithms*, 60(2):279–295, 2012.

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**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.
- [2] 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.
- [3] 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.

- [4] 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.
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- [6] 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.
- [7] 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.
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- [9] 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.
- [10] 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.
- [11] 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.
- [12] 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.
- [13] 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.
- [14] 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. Birkhäuser, 2010.

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- [16] 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.
- [17] 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.

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Selected Talks Scientific Computing Seminar, Lawrence Berkeley National Laboratory, Oct 2001.
 U. California at Berkeley, course ‘Matrix Computations’, coordinator B. N. Parlett, Oct 2001.
 Scientific Computing Seminar, Lawrence Berkeley National Laboratory, Aug 2005.
 Escuela Politécnica Superior de Albacete, U. Castilla-La Mancha, Jul 2006.
 Centro de Matemática, Universidade do Porto, Sep 2006.
 The Mathematics of Chemical Reactivity, Castro Urdiales (Spain), Jun 2009.
 Physical and Mathematical Challenges in Light of ITER, Marseille, Oct 2009.
 U. Autónoma de Barcelona, postgraduate course ‘Tools and Environments for Parallel Programming’ organized by E. César, Feb 2010.
 ETH Zürich, postgraduate course ‘Solving Large Scale Eigenvalue Problems’ organized by P. Arbenz and D. Kressner, May 2010.
 U. Autónoma de Madrid, Chemistry Department, Jan 2011.
 Barcelona Supercomputing Center, seminar on ‘Parallel Simulations in the Network’, Zaragoza, Nov 2010.
 U. Autónoma de Barcelona, postgraduate course ‘Tools and Environments for Parallel Programming’ organized by E. César, Feb 2011.

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Short Stays Mathematics and Computer Science Division, Argonne National Laboratory, Jul–Sep 2001.
 Computational Research Division, Lawrence Berkeley National Laboratory, Oct 2001.

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Professional Service Journal referee: ACM Transactions on Mathematical Software, Parallel Computing, J. Computational Physics, J. Supercomputing, Advances in Engineering Software, Revista Mexicana de Física.
 Conference referee: Euro-Par 2005, VECPAR 2004, 2006, 2008, PARA 2008.
 Programme Committee member: Parallel Matrix Algorithms and Applications (PMAA), 2008, 2010, 2012.
 Co-organizer: EPSA 2007 (*Eigenvalue Problems: Software and Applications*), Porto, June 2007.
 Organizing Committee member: VECPAR 2004, AARTC 2000.

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