Publications Olaf Schenk

Full Professor, Institute of Computational Science, USI Lugano, Switzerland, September 2018

Publications

Total: 34 journal papers, 5 book chapters, 22 top conference papers, 36 workshop and conference papers, 1 edited book, 8 edited conference proceedings, **4500+ citations, h-index: 28** (Google Scholar); full publication list available at http://www.ics.inf.usi.ch

Olaf Schenk and his PhD students and postdocs are underlined.

Peer-reviewed Journal Publications

IEEE Trans. Power Systems — D. Kourounis, A. Fuchs, O. Schenk, *Towards the next generation of multi-period optimal power flow solvers* , IEEE Transactions on Power Systems, December 2017, DOI: 10.1109/TPWRS.2017.2789187

COMPUT. SCIENCE — F. Verbosio, A. De Coninck, D. Kourounis, O. Schenk, *Enhancing the Scalability of Selected Inversion Factorization Algorithms in Genomic Prediction*, pp. 99-108, September 2017, Journal of Computational Science, DOI: 10.1016/j.jocs.2017.08.013

J. Comp. Physics — M. Rietmann, M. Grote, D. Peter, O. Schenk, *Newmark Local Time Stepping on High Performance Computing Architectures*, Volume 334, pp. 308–326, April 2017, Journal of Computational Physics, DOI: 10.1016/j.jcp.2016.11.012

GENETICS — A. De Coninck, B. Baets, D. Kourounis, F. Verbosio, O. Schenk, S. Maenhout, J. Fostier, *Needles: Large-Scale Genomic Prediction with Marker-by-environment Interaction*, January 2016, Journal of Genetics, DOI: 10.1534/genetics.115.179887

COMPUT. SCIENCE — J. Brumm, D. Mikushin, S. Scheidegger, O. Schenk, *Scalable High-Dimensional Dynamic Stochastic Economic Modeling*, Journal of Computational Science, 2015, DOI: 10.1016/j.jocs.2015.07.004

COMG — D. Kourounis, O. Schenk, *Constraint Handling for Gradient-Based Optimization of Compositional Reservoir Flow*, Journal of Computational Geosciences, October 2015, Volume 16(5), pp 1109–1122, DOI: 10.1007/s10596-015-9524-5

IEEE CiSE — C. Petra, O. Schenk, M. Anitescu, *Real-time Stochastic Optimization of Complex Energy Systems on High Performance Computers*, IEEE Computing in Science & Engineering - Leadership Computing (Volume: 16, Issue: 5), pp. 32–42, 2014. DOI: 10.1109/MCSE.2014.53

SIAM SISC — M. J. Grote, J. Huber, D. Kourounis, O. Schenk, *Inexact Interior-Point Method for PDE-Constrained Nonlinear Optimization*, SIAM J. Sci. Comput. 36–3, pp. A1251-A1276, 2014. DOI: 10.1137/130921283

SIAM SISC — C. Petra, O. Schenk, M. Lubin, K. Gärtner, *An Augmented Incomplete Factorization Approach for Computing the Schur Complement in Stochastic Optimization*, SIAM J. Sci. Comput. 36–2, pp. C139–C162, 2014. DOI: 10.1137/130908737

JPDC — G. Kollias, M. Sathe, O. Schenk, A. Grama, *Fast Parallel Algorithms for Graph Similarity and Matching*, Journal of Parallel and Distributed Computing, Volume 75, Issue 5, pp. 2400–2410, May 2014. DOI: 10.1016/j.jpdc.2013.12.010

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IJAMT S. Wagner, M. Sathe, O. Schenk, *Optimization for Process Plans in Sheet Metal Forming*, The International Journal of Advanced Manufacturing Technology, Volume 71, Issue 5-8, pp 973–982, March 2014. DOI: 10.1007/s00170-013-5515-7

IEEE Trans. Elec. Devices M. Luisier, O. Schenk, *Gate-Stack Engineering in n-type Ultra-Scaled Si Nanowire Field-Effect Transistors*, IEEE Transactions on Electron Devices, pp. 3325–3329, Oct 2013. DOI: 10.1109/TED.2013.2278573

G^3 P. Basini, T. Nissen-Meyer, L. Boschi, E. Casarotti, J. Verbeke, O. Schenk, D. Giardini, *The Influence of Nonuniform Ambient Noise on Crustal Tomography in Europe*, Geochem. Geophys. Geosyst., 14, 1471–1492, 2013. DOI: 10.1002/ggge.20081

PARCO M. Sathe, O. Schenk, H. Burkhart, *An Auction-Based Weighted Matching Implementation on Massively Parallel Architectures*, Parallel Computing 38, pp. 595-614, 2012. DOI: 10.1016/j.parco.2012.09.001

Math. Prog. F. Curtis, J. Huber, O. Schenk, A. Wächter, *A Note on the Implementation of an Interior-Point Algorithm for Nonlinear Optimization with Inexact Step Computations*, Mathematical Programming Series B, 32(6), 3447-3475, 2012. DOI: 10.1007/s10107-012-0557-4.

JCSRD M. Christen, O. Schenk, H. Burkhart, *Automatic Code Generation and Tuning for Stencil Kernels on Modern Microarchitecture*, Journal Computer Science Research and Development, in Proceedings of the International Supercomputing Conference, ISC11, Volume 26, pp. 205–210, 2011. DOI: 10.1007/s00450-011-0160-6

SIAM SISC F. E. Curtis, O. Schenk, A. Wächter, *An Interior-Point Algorithm for Large-Scale Nonlinear Optimization with Inexact Step Computations*. SIAM J. Sci. Comput. Volume 32, Issue 6, pp. 3447–3475, 2010. DOI: 10.1137/090747634

SIAM SISC M. Bollhöfer, M. Grote, O. Schenk, *Algebraic Multilevel Preconditioning to Helmholtz's Equation for Inhomogeneous Media*, SIAM J. Scientific Computing, Volume 31(5), pp. 3781–3805, 2009. DOI: 10.1137/080725702

JCSRD O. Schenk, M. Manguoglu, A. Sameh, M. Christen, M. Sathe, *Parallel Scalable PDE-Constrained Optimization: Antenna Identification in Hyperthermia Cancer Treatment Planning*, in Proceedings of the International Supercomputing Conference, ISC'09, Journal Computer Science Research and Development, pp. 177–183, 23(3), 2009. DOI: 10.1007/s00450-009-0080-x

SIAM SISC O. Schenk, A. Wächter, M. Weiser, *Inertia Revealing Preconditioning For Large-Scale Nonconvex Constrained Optimization*, SIAM J. Sci. Comput., pp. 939–960 31(2), 2008. DOI: 10.1137/070707233

JPDC O. Schenk, M. Christen, H. Burkhart, *Algorithmic Performance Studies on Graphics Processing Units*, J. Parallel and Distributed Computing, 68, 1360-1369, 2008. DOI: 10.1016/j.jpdc.2008.05.008

SIAM Review O. Schenk, M. Bollhöfer, R. Römer, *On Large-Scale Diagonalization Techniques for the Anderson model of Localization*, SIAM Review, pp. 91-112, 50, 2008, DOI: 10.1137/050637649

COMPUT. OPTIM. APPL. O. Schenk, A. Wächter, M. Hagemann, *Matching-based Preprocessing Algorithms to the Solution of Saddle-Point Problems in Large-Scale Nonconvex Interior-Point Optimization*, Journal of Computational Optimization and Applications, pp. 321-341, 32 (2-3), 2007, DOI: 10.1007/s10589-006-9003-y

GAMM M. Bollhöfer, O. Schenk, *Combinatorial Aspects in Sparse Direct Solvers*, GAMM Mitteilungen, Vol. 29, pp. 342–367, 2006, DOI: 10.1002/gamm.201490037

ETNA O. Schenk, K. Gärtner, *Fast Factorization Pivoting Methods for Sparse Symmetric Indefinite Systems*. Electronic Transactions on Numerical Analysis, 23, 2006, pp. 158–179.

SIAM SISC O. Schenk, M. Bollhöfer, R. Römer, *On Large-Scale Diagonalization Techniques for the Anderson model of Localization*, SIAM J. Sci. Comput., 28 (2006), pp. 963–983. DOI: 10.1137/050637649

SIAM SISC M. Hagemann, O. Schenk, *Weighted Matchings for Preconditioning Symmetric Indefinite Linear Systems*, SIAM J. Sci. Comput., 28, pp. 403–420, 2006, DOI: 10.1137/040615614

COMPUT. STRUCT O. Schenk, M. Hillmann, *Optimal Design of Metal Forming Die Surfaces with Evolution Strategies*, Computer & Structures, 82, pp. 1695–1705, 2004. DOI: 10.1016/j.compstruc.2004.03.055

IEEE TCAD O. Schenk, S. Röllin, A. Gupta, *The Effects of Unsymmetric Matrix Permutations and Scalings in Semiconductor Device and Circuit Simulation*, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 23, pp. 400–411, 2004. DOI: 10.1109/TCAD.2004.823345

JFGCS O. Schenk, K. Gärtner, *Solving Unsymmetric Sparse Systems of Linear Equations with PARDISO*, J. of Future Generation Computer Systems, 20, pp. 475–487, 2004. DOI: 10.1016/j.future.2003.07.011

PARCO	O. Schenk, K. Gärtner, *Two-Level Scheduling in PARDISO: Improved Scalability on Shared Memory Multiprocessing Systems*, Parallel Computing, pp. 187–197., 28, 2002. DOI: 10.1016/S0167-8191(01)00135-1
ISECS	O. Schenk, K. Gärtner, B. Schmithüsen, W. Fichtner. *Numerical Semiconductor Device and Process Simulation on Shared Memory Multiprocessors: Algorithms, Architectures, Results*. The Kluwer International Series in Engineering and Computer Science, 515, pp. 141–157, 1999.
JFGCS	O. Schenk, K. Gärtner, W. Fichtner, A. Stricker, *PARDISO: A High-Performance Serial and Parallel Sparse Linear Solver in Semiconductor Device Simulation*, J. of Future Generation Computers Systems, 18, pp. 69–78, 2001 DOI: 10.1016/S0167-739X(00)00076-5
BIT	O. Schenk, K. Gärtner, W. Fichtner, *Efficient Sparse LU Factorization with Left-Right Looking Strategy on Shared Memory Multiprocessors*, BIT Numerical Mathematics, 40, pp. 158–176, 1999. DOI: 10.1023/A:1022326604210
Speedup Journal	K. Gärtner, O. Schenk, W. Fichtner, *Parallel Multigrid Methods for the Continuity Equations in Semiconductor Device Simulation*, Speedup Journal, 12, pp. 67–72, 1999.

Peer-reviewed Conference Publications

SC'18	A. Eftekhari, M. Bollhöfer, O. Schenk, *Distributed Memory Sparse Inverse Covariance Matrix Estimation on High-Performance Computing Architectures*, in Proceedings of the International Conference on High Performance Computing, Networking, Storage and Analysis, SC'18, IEEE Computer Society Press, Nov. 2018, (acceptance rate: 19%, 54/288).
SBAC-PAD 2018	M. Wittmann, G. Hager, R. Janalik, M. Lanser, A. Klawonn, O. Rheinbach, O. Schenk, G. Wellein, *Multicore Performance Engineering of Sparse Triangular Solves Using a Modified Roofline Model* in Proceedings of the 30th IEEE International Symposium on Computer, Architecture and High Performance Computing, September 24-27, 2018 (SBAC-PAD 2018), Ecole Normale Superieure, Lyon, France, (acceptance rate: 28.5%, 42/150).
SBAC-PAD 2018	F. Verbosio, J. Kardos, M. Bianco, and O. Schenk, *Highly Scalable Stencil-based Matrix-free Stochastic Estimator for the Diagonal of the Inverse* in 9th Workshop on Applications for Multi-Core Architectures, September 24-27, 2018 ENS Lyon, Lyon, France, 30th IEEE International Symposium on Computer, Architecture and High Performance Computing (SBAC-PAD 2018), September 24-27, 2018, Ecole Normale Superieure, Lyon, France, (acceptance rate: 28.5%, 42/150).
SISPAD 2018	M. Luisier, F. Ducry, M. Bani-Hashemian, S. BrÃijck, M. Calderara, O. Schenk, *Advanced Algorithms for Ab-initio Device Simulations* in Proceedings of the IEEE International Conference on Simulation of Semiconductor Processes and Devices 2018, Austin, Texas, USA (SISPAD2018), 24-26 September, 2018.
IPDPS'18	S. Scheidegger, D. Mikushin, F. Kuebler, O. Schenk, *Rethinking large-scale economic modeling for efficiency: optimizations for GPU and Xeon Phi clusters*, in Proceedings of the 32th IEEE International Parallel & Distributed Processing Symposium, IPDPS'18, IEEE Computer Society, pp. 610-619, May 2018, DOI: 0.1109/IPDPS.2018.00070 (acceptance rate: 21.8%, 108/496).
ICCS 2018	T. Yamaguchi, K. Fujita, T. Ichimura, A. Glerum, Y. van Dinther, T. Hori, O. Schenk, M. Hori, M. Lalith, Viscoelastic Crustal Deformation Computation Method with Reduced Random Memory Accesses for GPU-based Computers in Proceedings of International Conference on Computational Science 2018 (ICCS 2018), Wuxi, China 11-13 June, 2018, Y. Shi et al. (Eds.): ICCS 2018, LNCS 10861, pp. 31-43, 2018. DOI: 10.1007/978-3-319-93701-4_3
PSCC 2018	C. O Malley, L. Roald, D. Kourounis, O. Schenk, G. Hug, *Security Assessment in Gas-Electric Networks*, in IEEE Xplore Proceedings of the 20th Power Systems Computation Conference, IEEE Xplore Proceedings. PSCC 2018, 20th Power Systems Computation Conference. Dublin, Ireland. June 11-15, 2018, DOI: 10.23919/PSCC.2018.8442923
ENERGY CON2018	O. Conor, G. Hug, D. Kourounis, O. Schenk, Finite Volume Methods for Transient Modeling of Gas Pipelines in IEEE Proceedings of the 5th IEEE International Energy Conference. 5th IEEE International Energy Conference. Limassol, Cyprus. 3-7 Jun, 2018, DOI: 10.1109/ENERGYCON.2018.8398787
PASC'18	T. Simpson, D. Pasadakis, D. Kourounis, K. Fujita, T. Yamaguchi, T. Ichimura, O. Schenk, *Load-Balanced Partition Refinement with the Graph p-Laplacian*, in Proceedings of the ACM Platform for Advanced Scientific Computing Conference, PASC'18, July 2018, DOI: 10.1145/3218176.3218232 (acceptance rate: 21.5%).

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HPCSE2017 S. Donfack, P. Sanan, O. Schenk, B. Reps, W. Vanroose, *A High Arithmetic Intensity Krylov Subspace Method Based on Stencil Compiler Programs*, in Proceedings of the International Conference on High Performance Computing in Science and Engineering. Springer International Publishing. Lecture Notes in Computer Science, vol. 11087. Springer, Cham. HPCSE2017. Solan, Czech Republic. May 2017. DOI: 10.1007/978-3-319-97136-0_1

Lattice'17 J. Bloch, O. Schenk, *Selected inversion as key to a stable Langevin evolution across the QCD phase boundary*, 35th International Symposium on Lattice Field Theory (Lattice 2017), DOI: https://arxiv.org/abs/1707.08874

PASC'17 A. Eftekhari, O. Schenk, S. Scheidegger, *Parallelized Dimensional Decomposition for Dynamic Stochastic Economic Models*, in Proceedings of the ACM Platform for Advanced Scientific Computing Conference, PASC'17, pages 38:1–38:11. June 2017, DOI: 3093172.3093234 (acceptance rate: 33%, 13/39).

LNCS L. Riha, T. Brzobohaty, A. Markopoulos, T. Kozubek, O. Schenk, W. Vanroose, *Efficient Implementation of FETI Solver for Multi and Many-Core Architectures using Schur Complements*, September 2015, Proceedings of the International Conference on High Performance Computing in Science and Engineering, HPCSE2015, Lecture Notes in Computer Science (LNCS), Vol: 9611, Springer, 2016, DOI:10.1007/978-3-319-40361-8_6

PDP'15 A. De Coninc, D. Kourounis, F. Verbosio, O. Schenk, B. De Baets, S.. Maenhout, J. Fostier, *Towards Parallel Large-scale Genomic Prediction by Coupling Sparse and Dense Matrix Algebra*, in Proceedings of the 23rd Euromicro International Conference on Parallel, Distributed, and Network-Based Processing, 747–750, 2015. DOI: 10.1109/PDP.2015.94

IPDPS'15 M. Rietmann, M.J. Grote, D. Peter, O. Schenk, B. Ucar, *Load-balanced Local Time Stepping for Large-Scale Wave Propagation*, in Proceedings of the 29th IEEE International Parallel & Distributed Processing Symposium, IPDPS'15, IEEE Computer Society, May 2015, DOI:10.1109/IPDPS.2015.10 (acceptance rate: 21.8%, 108/496)

AGU'14 P. Sanan, S. Schnepp, D. May, O. Schenk, *Composite Solvers for Linear Saddle Point Problems Arising from the Incompressible Stokes Equations with Highly Heterogeneous Viscosity Structure*, American Geophysical Union. Fall Meeting, San Francisco, Dec. 15-19, 2014.

Euro-Par'13 A. Kuzmin, M. Luisier, O. Schenk, *Fast Methods for Computing Selected Elements of the Green's Function in Massively Parallel Nanoelectronic Device Simulations*, Euro-Par 2013, LNCS 8097, F. Wolf, B. Mohr, and D. an Ney (Eds.), Springer-Verlag, pp. 533–544, 2013, DOI: 10.1007/978-3-642-40047-6_54

Wave'13 L. Gaudio, M. J. Grote, O. Schenk, *Interior Point Method for Time-Dependent Inverse Problems*, in Proceedings of 11th Internat. Conf. on Math. and Numerical Aspects of Wave Propagation (WAVES 2013), pp. 121-122, 2013.

SC'12 M. Rietmann, O. Schenk, P. Messmer, T. Nissen-Meyer, D. Peter, P. Basini, D. Komatitsch, J. Tromp, L. Boschi, D. Giardini, *Forward and Adjoint Simulations of Seismic Wave Propagation on Emerging Large-Scale GPU Architectures*, in Proceedings of the International Conference on High Performance Computing, Networking, Storage and Analysis, SC'12, pages 38:1–38:11. IEEE Computer Society Press, Nov. 2012, DOI: 10.1109/SC.2012.59 (acceptance rate: 21%, 100/472).

SC'12 M. Christen, O. Schenk, Y. Cui, *PATUS: Parallel Auto-Tuned Stencils For Scalable Earthquake Simulation Codes*, in Proceedings of the International Conference on High Performance Computing, Networking, Storage and Analysis, SC'12, pages 38:1–38:11. IEEE Computer Society Press, Nov. 2012, DOI: 10.1109/SC.2012.95 (acceptance rate: 21%, 100/472)

PGAS'12 H. Burkhart, M. Sathe, M. Christen, M. Rietmann, O. Schenk, *Run, Stencil, Run, HPC Productivity Studies in the Classroom*, 6th Conference on Partitioned Global Address Space Programming Models, October 10-12, 2012, Santa Barbara, USA.

ICCS'12 M. Christen, O. Schenk, *A Performance Study of an Anelastic Wave Propagation Code Using Auto-tuned Stencil Computations*, Proceedings of the International Conference on Computational Science, ICCS 2012, Eds., vol. 9. Elsevier, 2012, pp. 956–965, DOI:10.1016/j.procs.2012.04.102

IPDPS'11 M. Christen, O. Schenk, H. Burkhart, *Patus: A Code Generation and Autotuning Framework For Parallel Iterative Stencil Computations on Modern Microarchitectures*, in Proceedings of the 25th IEEE International Parallel & Distributed Processing Symposium, IPDPS'11, pages 676–687, IEEE Computer Society, May 2011, DOI: 10.1109/IPDPS.2011.70 (acceptance rate: 19.6%, 112/571)

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Wave'11 M. Grote, <u>J. Huber</u>, <u>O. Schenk</u>, *Inexact Interior-Point Methods for Time-Harmonic Inverse Medium Problems*, 10th International Conference on Mathematical and Numerical Aspects of Waves, Simon Fraser University Harbor Center, Vancouver, Canada. July 2011.

ICCS'11 M. Grote, <u>J. Huber</u>, <u>O. Schenk</u>, *Towards Interior Point Methods for the Inverse Medium Problem on Massively Parallel Architectures*, Procedia Computer Science Volume 4, 2011, pp. 1466-1474, Proceedings of the International Conference on Computational Science, ICCS 2011. DOI: 10.1016/j.procs.2011.04.159

PARS'11 H. Burkhart, <u>M. Christen</u>, <u>M. Rietmann</u>, <u>M. Sathe</u>, <u>O. Schenk</u>, *Run, Stencil, Run! - A Comparison of Modern Parallel Programming Paradigms*, PARS - Workshop on Parallel Systems and Algorithms PARS 2011, May 26-27, 2011, IBM Research RÃijschlikon, Switzerland.

PARS'11 <u>M. Sathe</u>, <u>O. Schenk</u>, <u>M. Christen</u>, H. Burkhart, *A Parallel PDE-Constrained Optimization Framework for Biomedical Hyperthermia Treatment Planning*, PARS-Mitteilungen (ISSN 0177-0454).

Euro-Par'09 M. Manguoglu, A. Sameh, <u>O. Schenk</u>, *PSPIKE — Parallel Sparse Linear System Solver*, Proceedings of the 15th International Euro-Par Conference on Parallel Processing, Lecture Notes in Computer Science, Volume 5704/2009, pp. 797-808, DOI 10.1007/978-3-642-03869-3_74.

IPDPS'09 <u>M. Christen</u>, <u>O. Schenk</u>, P. Messmer, E. Neufeld, H. Burkhart, *Parallel Data-Locality Aware Stencil Computations on Modern Micro-Architectures*, in Proceedings of the 23th IEEE International Parallel & Distributed Processing Symposium, IPDPS'09, pages 1–10, IEEE Computer Society, May 2009, DOI: 10.1109/IPDPS.2009.5161031 (acceptance rate: 18.2%, 102/591)

EMO'09 <u>M. Sathe</u>, <u>O. Schenk</u>, and H. Burkhart, *Solving Bi-Objective Many-Constraint Bin Packing Problems in Automobile Sheet Metal Forming Processes*, Proceedings of the 5th International Conference on Evolutionary Multi-Criterion Optimization, Nantes, France, April 2009, Lecture Notes in Computer Science, Springer, 5467, pp. 246-261, 2009, DOI: 10.1007/978-3-642-01020-0_22

MICRO-41 <u>M. Christen</u>, <u>O. Schenk</u>, P. Messmer, E. Neufeld, H. Burkhart, *Biomedical Hyperthermia Cancer Treatment Planning on Leading Multicore Platforms*, Proceedings of the First International Workshop on New Frontiers in High-performance and Hardware-aware Computing (HipHaC'08). IEEE/ACM International Symposium on Microarchitecture (MICRO-41), pp. 47-54, ISBN 978-3-86644-298-6, November 8, 2008, Lake Como, Italy.

CUDA'07 <u>M. Christen</u>, <u>O. Schenk</u>, H. Burkhart, *General-Purpose Sparse Matrix Building Blocks using the NVIDIA CUDA Technology Platform*, First Workshop on General Purpose Processing on Graphics Processing Units, Boston, Oct 04, 2007.

ICIAM'07 <u>O. Schenk</u>, M. Bollhöfer, R. Römer, *On Large-Scale Diagonalization Techniques for the Anderson Model of Localization*, In Proc. of the 6th International Congress on Industrial and Applied Mathematics, ETH Zurich, Switzerland July 25-29, 2007, DOI: 10.1002 /pamm.200700768

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PARA'04 S. Röllin, <u>O. Schenk</u>, *Maximum-Weighted Matching Strategies and the Application to Symmetric Indefinite Systems*, in J. Dongarra, K. Madsen, J. Wasniewski (Eds.): Applied Parallel Computing, State of the Art in Scientific Computing, 7th International Workshop, PARA 2004, Lyngby, Denmark, June 20-23, 2004, Springer 2006, ISBN 3-540-29067-2, Lecture Notes in Computer Science, Springer, 3732 (2006), pp. 808–817. DOI: 10.1007/11558958_97

Euro-Par'04 K. Fürlinger, <u>O. Schenk</u>, <u>M. Hagemann</u>, *Task-Queue Based Hybrid Parallelism: A Case Study*, in Euro-Par 2004 Parallel Processing, 10th International Euro-Par Conference, Pisa, Italy, August 31-September 3, 2004, pp. 624–631, DOI: 10.1007/978-3-540-27866-5_82

CompLife'05 P. Banushkina, <u>O. Schenk</u>, M. Meuwly, *Efficiency Considerations in Solving Smoluchowski Equations for Rough Potentials*, in M. R. Berthold, R. C. Glen, K. Diederichs, O. Kohlbacher, I. Fischer (Eds.): Computational Life Sciences, First International Symposium, CompLife 2005, Konstanz, Germany, September 25-27, Proceedings. Springer, ISBN 3-540-29104-0, Lecture Notes in Computer Science, 3695, pp. 208–216, 2005, DOI: 10.1007/11560500_19

SISPAD'03 <u>O. Schenk</u>, <u>M. Hagemann</u>, S. Röllin, *Recent Advances in Sparse Linear Solver Technology for Semiconductor Device Simulation Matrices*, In Proc. of the 2003 IEEE International Conference on Simulation of Semiconductor Processes and Devices, pp. 103–108, ISBN 0-07803-7826-1, September 3-5, 2003.

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Comp-Fluid'03 O. Schenk, M. Selig, *Advancing Crash Forming Capabilities through Solver Technology*, Proc. of the Second M.I.T. Conference on Computational Fluid and Solid Mechanics, 1 (2003), pp. 628–631, ISBN 0-08-044046-0, June 17-21, 2003, Boston, USA.

ICCS'02 O. Schenk, K. Gärtner, *Solving Unsymmetric Sparse Systems of Linear Equations with PARDISO*, in P. M. A. Sloot, C. Jeng, K. Tan, J. Dongarra, A. G. Hoekstra (Eds.), Computational Science - ICCS 2002, International Conference, Amsterdam, The Netherlands, April 21-24, 2002, Proceedings, Springer, ISBN 3-540-43593-X , Lecture Notes in Computer Science, 2330 (2002), pp. 355–363. DOI: 10.1007/3-540-46080-2_37

IMACS'00 O. Schenk, K. Gärtner, *Scalable Parallel Sparse LU Factorization with a Dynamical Supernode Pivoting Approach in Semiconductor Device Simulation*, Proc. of the 16th IMACS World Congress 2000, Lausanne, Switzerland, August 21-25, 2000.

HPCN'99 O. Schenk, W. Fichtner, K. Gärtner, *Scalable Parallel Sparse Factorization with Left-Right Looking strategy on Shared Memory Multiprocessors*, in P. M. A. Sloot, M. Bubak, A. G. Hoekstra, L. O. Hertzberger (Eds.): HPC and Networking, 7th International Conference, HPCN Europe 1999, Amsterdam, The Netherlands, Proceedings, Springer 1999, ISBN 3-540-65821-1, Lecture Notes in Computer Science, 1593 (1999), pp. 221–230. DOI: 10.1007/BFb0100583

ISHPC'99 O. Schenk, W. Fichtner, K. Gärtner, *Application of Parallel Sparse Direct Methods in Semiconductor Device and Process Simulation*, in C. D. Polychronopoulos, K. Joe, A. Fukuda, S. Tomita (Eds.): High Performance Computing, Second International Symposium, ISHPC'99, Kyoto, Japan, 1999, Proceedings. Springer 1999, ISBN 3-540-65969-2, Lecture Notes in Computer Science, 1615 (1999), pp. 206–219, DOI: 10.1007/BFb0094923

LNCSE K. Gärtner, O. Schenk, W. Fichtner, *Parallel Multigrid Methods for the Continuity Equations in Semiconductor Device Simulation*, in H. J. Bungartz, C. Zenger (Eds.): High Performance Scientific and Engineering Computing, Lecture Notes in Computational Science and Engineering, 8 (1998), pp. 325–342.

Precon'99 A. Pomp, O. Schenk, W. Fichtner, *An ILU Preconditioners Adapted to Diffusion Processes in Semiconductors*, Proc. of Preconditioning 1999, Conference on Preconditioning Techniques for Large Sparse Matrix Problems in Industrial Applications, June, 1999, Minneapolis, USA.

PDPTA'98 O. Schenk, W. Fichtner, K. Gärtner, *Parallel Sparse LU Factorization in a Shared Memory Computing Environment*, Proc. of the PDPTA98, CSREA Press, pp. 907–914, ISBN 1-892512-05-x, Las Vegas, Nevada, USA, July 13-16, 1998.

Edited Books

CRC Press U. Naumann, O. Schenk (Editors), *Combinatorial Scientific Computing*, book in the Computational Science series from Chapman and Hall/CRC, 2012. DOI: 10.1201/b11644-18

Book Chapters

CRC Press J. Huber, U. Naumann, O. Schenk, A. Wächter, *Algorithmic Differentiation and Nonlinear Optimization for an Inverse Medium Problem*, Chapter in Combinatorial Scientific Computing by U. Nauman and O. Schenk (Editors), pp. 203-232, book in the Computational Science series from Chapman and Hall/CRC, 2012, DOI: 10.1201/b11644-18

CRC Press O. Schenk, M. Sathe, B. Ucar, A. Sameh, *Towards A Scalable Hybrid Linear Solver Based On Combinatorial Algorithms*, chapter in Combinatorial Scientific Computing by U. Nauman and O. Schenk (Editors), pp. 96-127, book in the Computational Science series from Chapman and Hall/CRC, 2012, DOI: 10.1201/b11644-18

CRC Press O. Schenk, M. Christen, H. Burkhart, *Parallel Stencil Computations on Manycore Architectures in Hyperthermia Applications*, Scientific Computing with Multicore and Accelerators by D. Bader and J. Dongarra (Editors), Computational Science series from Chapman and Hall/CRC Press, Taylor and Francis Group. pp. 255–277, 2011. DOI: 10.1201/b10376-10, 2010.

Springer O. Schenk, K. Gärtner, *Parallel Numerical Linear Algebra*, invited book chapter in Encyclopedia of Parallel Computing, D. Padua (Editor), pp. 1458–1464, Springer, 2012, ISBN 978-0-387-09765-7.

Elsevier O. Schenk, H. van der Vorst, *Solution of Linear Systems*, chapter in Handbook of Numerical Analysis, Volume XIII: Numerical Methods in Electromagnetics, Elsevier Science, ISBN 0-444-513752, pp. 755–824, 2005.

Edited Journals

PARCO E. Agullo, P. Arbenz, L. Giraud, O. Schenk, *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'16)*, Parallel Computing, May 2018, vol 74, pp. 1-2. DOI: 10.1016/j.parco.2018.01.003

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CCPE	C. Lengauer, M. Bolten, R. Falgout, <u>O. Schenk</u>, X. Zhou, L. Zhao, *Guest editorial: Special Issue on Advanced Stencil-Code Engineering*, Journal on Concurrency and Computation: Practice and Experience, 2017, Volume 29, Issue 18, DOI: 10.1002/cpe.4142
PARCO	P. Arbenz, L. Grigori, R. Krause, <u>O. Schenk</u>, *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'14, Part 2)*, Parallel Computing, pp. 135-136, August 2016, DOI: 10.1016/j.parco.2016.08.003
DAGSTUHL	C. Lengauer, M. Bolten, R. D. Falgout, <u>O. Schenk</u>, 15161 Abstracts Collection, *Advanced Stencil-Code Engineering*, 15161, Dagstuhl Seminar Proceedings, pp. 56–75, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Germany, 2015. DOI: 10.4230/DagRep.5.4.56
PARCO	P. Arbenz, L. Grigori, R. Krause, <u>O. Schenk</u>, *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'14, Part 1)*, Parallel Computing, pp. 99-100 (2015) , DOI: 10.1016/j.parco.2015.10.004
PARCO	C. Bekas, A. Grama, <u>O. Schenk</u>, Y. Saad, *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'12)*, Parallel Computing, Volume 40, Issue 7, pp. 159–160, July 2014. DOI: 10.1016/j.parco.2014.06.001
PARCO	P. Arbenz, Y. Saad, A. Sameh, <u>O. Schenk</u>: *Guest editorial: Special Issue on Parallel Matrix Algorithms and Applications (PMAA'10)*, Parallel Computing, 37(12):731–732, 2011. DOI: 10.1016/j.parco.2011.10.011
DAGSTUHL	U. Naumann, <u>O. Schenk</u>, H. Simon, S. Toledo, 09061 Abstracts Collection, *Combinatorial Scientific Computing*, 09061, Dagstuhl Seminar Proceedings, 1862-4405, Schloss Dagstuhl - Leibniz-Zentrum für Informatik, Germany, 2009
JFGCS	P. Arbenz, H. Burkhart, <u>O. Schenk</u>, E. Mähle, *SPEEDUP/PARS Workshop on Modern Algorithms in Computational Sciences and Information Technology*, J. of Future Generation Computer Systems, 21 (8), pp. 1249–1250, 2005, DOI: 10.1016/j.future.2004.09.002

Patent

European Patent	<u>D. Kourounis</u>, <u>O. Schenk</u>, *Processing of Multiperiod Optimal Power Flow Problems using Structure-Exploiting Interior Point Methods*, European Patent Office., PCT - International patent application No. PCT/EP2017/057632, filed on March 2017

Monographic Thesis

PhD Thesis

Title	*Parallel Sparse LU Factorization Methods on Shared Memory Multiprocessors*
Supervisors	Professor Wolfgang Fichtner (ETH Zurich) & Professor Martin Gutknecht (ETH Zurich)
Description	This dissertation presents new techniques for solving large sparse symmetric and structurally symmetric linear systems on shared memory high performance parallel computers, using Gaussian elimination with complete supernode pivoting. Shared memory multiprocessors have recently attracted considerable interest in scientific and engineering computing and the objective is to increase the parallel performance on these architectures. The efficiencies of the algorithms are demonstrated for matrices from various application fields and for a variety of high performance computers
Place	ETH Zurich, 2000, Series in Microelectronics, Volume 89, Hartung-Gorre, ISBN 3-89649-532-1.
doi	dx.doi.org/10.3929/ethz-a-003876213

Habilitation Thesis

Title	*Scientific Computing - Algorithms, Combinatorics, High-Performance Computing, and Applications*
Place	Department of Computer Science and Mathematics, Faculty of Science, University of Basel, Switzerland, March 2010.

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Description This research introduced some of the many ways in which combinatorial abstractions and numerical algorithms in computer science play a role in computational science. It is explained how these algorithms might be useful in scientific applications. It deals in particular with scientific algorithmic research and high-performance computing architectures to enable large-scale simulations and optimizations. This is a discipline where computing power is a critical issue in almost every application. Complex simulation models containing more degrees of freedom not only require more available space in memory, but also demand faster computing architectures, sophisticated algorithms, and modern HPC technology to compute solutions to these models within an acceptable time frame. In general, the research spans the entire stack, from advanced information technology to scientific algorithmic research.

Patent

PCT D. Kourounis, O. Schenk, *Method to accelerate the processing of multiperiod optimal power flow problems*, PCT - International patent application No. PCT/EP2017/057632, filed on 30 March 2017

Publication Impact

Citations

Number of citations for my ten most cited papers (Source: Google Scholar as of August 13, 2018, scholar.google.com)

citations	paper
1169	Solving unsymmetric sparse systems of linear equations with PARDISO (🕮 DOI Link)
578	On fast factorization pivoting methods for sparse symmetric indefinite systems (🕮 DOI Link)
266	Patus: A code generation and autotuning framework for parallel iterative stencil computations on modern microarchitectures (🕮 DOI Link)
194	Matching-based preprocessing algorithms to the solution of saddle-point problems in large-scale nonconvex interior-point optimization (🕮 DOI Link)
188	Efficient sparse LU factorization with left-right looking strategy on shared memory multiprocessors (🕮 DOI Link)
154	On large-scale diagonalization techniques for the Anderson model of localization (🕮 DOI Link)
112	PARDISO: a high-performance serial and parallel sparse linear solver in semiconductor device simulation (🕮 DOI Link)
127	Fast methods for computing selected elements of the Green's function in massively parallel nanoelectronic device simulation (🕮 DOI Link)
91	Optimal design of metal forming die surfaces with evolution strategies (🕮 DOI Link)
95	Algebraic multilevel preconditioner for the Helmholtz equation in heterogeneous media (🕮 DOI Link)

Impact factors

Impact factors of the journals I have published in (Source: Journal Citation Reports 2016, Thomson Scientific.):

Journal	Impact Factor 2016	5-Year Impact Factor
IEEE Transactions on Power Systems	5.68	7.26
SIAM Review	4.89	7.26
Genetics	4.55	5.09
J. of Future Generation Computer Systems	3.997	4.78
Geochem. Geophys. Geosyst.	3.20	3.41
Computer&Structures	2.84	3.18
Journal of Computational Physics	2.74	3.12
IEEE Computing in Science & Engineering	2.07	3.09
Mathematical Programming Series B	2.44	2.98
IEEE Transactions on Electron Devices	2.60	2.84
SIAM J. Sci. Comput	2.19	2.80
Journal of Advanced Manufacturing Technology	2.20	2.29
Journal of Computational Geosciences	1.60	2.25
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems	1.94	2.12
Parallel Computing	1.36	2.01
Journal of Computational Science	1.74	2.00
Journal of Parallel and Distributed Computing	1.93	1.97
BIT Numerical Mathematics	1.67	1.96

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