

# FRANZ FRANCHETTI

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## APPOINTMENTS

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- 2021- **Associate Dean for Research**  
College of Engineering  
Carnegie Mellon University, USA
- 2021- **Director, Engineering Research Accelerator**  
College of Engineering  
Carnegie Mellon University, USA
- 2021- **Kavčič-Moura Professor of ECE**  
Department of Electrical and Computer Engineering  
Carnegie Mellon University, USA
- 2017-2021 **Professor of ECE**  
Department of Electrical and Computer Engineering  
Carnegie Mellon University, USA
- 2016-2017 **Associate Professor**  
Department of Electrical and Computer Engineering  
Carnegie Mellon University, USA
- 2012-2016 **Associate Research Professor**  
Department of Electrical and Computer Engineering  
Carnegie Mellon University, USA
- 2008-2012 **Assistant Research Professor**  
Department of Electrical and Computer Engineering  
Carnegie Mellon University, USA
- 2005-2008 **Systems Scientist (Special Faculty)**  
Department of Electrical and Computer Engineering  
Carnegie Mellon University, USA
- 2004-2005 **Postdoctoral Research Associate, SPIRAL**  
Erwin Schrödinger Fellowship J2322, funded by the  
Austrian Science Fund FWF, Advisor: M. Püschel  
Department of Electrical and Computer Engineering  
Carnegie Mellon University, USA
- 2003 **Postdoctoral Research Associate, Advanced Scientific Computing Team**  
AURORA Project 5, principal investigator C. W. Ueberhuber  
Institute for Applied Mathematics and Numerical Analysis  
Vienna University of Technology, Austria
- 2000-2003 **Research Assistant, Advanced Scientific Computing Team**  
AURORA Project 5, principal investigator C. W. Ueberhuber  
Institute for Applied Mathematics and Numerical Analysis  
Vienna University of Technology, Austria

- 1997-2003     **Part-time System Administrator**, Vienna University of Technology, Austria
- 1994-2002     **Part-time System Administrator**, Zentrplan GmbH, Wr. Neustadt, Austria

## **LEADERSHIP AND VISITING POSITIONS**

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- 2019-           **R-CCS Senior Visiting Scientist**, Riken, Japan
- 2019-           **Adjunct Professor of Biomedical Informatics**, Dept. of Biomedical Informatics,  
School of Medicine, University of Pittsburgh, Pittsburgh, USA
- 2019-           **Honorary Consul of the Republic of Austria**, Western Pennsylvania, USA
- 2015-           **Faculty Director of Information Technology Services**  
Department of Electrical and Computer Engineering, Carnegie Mellon, Pittsburgh, USA
- 2014-2019      **President**, Austrian Scientists and Scholars in North America (ASciNA)
- 2013-2019      **Visiting Scientist**, Riken, Japan
- 2009-           **CTO (since 2011) and Co-Founder**, SpiralGen, Inc., Pittsburgh, USA

## **EDUCATION**

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- 2003           **Dr. techn. (Ph.D.)** in Computational Mathematics, with distinction  
Vienna University of Technology
- 2000           **Dipl.-Ing. (M.Sc.)** in Technical Mathematics, with distinction  
Concentration: *Mathematical Computer Sciences*  
Vienna University of Technology
- 1994           **HTL Matura** (Engineering High School Diploma), with distinction  
theoretical and practical training in Mechanical Engineering and Automation  
HTBLuVA Wiener Neustadt (high school with post-secondary engineering focus)

## **AWARDS**

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- 2020           Best Poster Award, Supercomputing (SC) 2020  
together with S. Mionis (lead student), J. Larkin (CMU SEI)
- 2020           Outstanding Student Paper Award, High Performance Embedded Computing (HPEC)  
2020 together with S. Rao (lead student), A. Kutuluru, P. Brower, S. McMillan (CMU SEI)
- 2018           Best Paper Finalist, High Performance Extreme Computing (HPEC) 2018  
together with V. Ruzicka
- 2018           Student Innovation Award, High Performance Extreme Computing (HPEC) 2018  
together with F. Sadi (lead student), J. Sweeney, S. McMillan, T. M. Low, J. C. Hoe,  
L. Pileggi
- 2018           MIT GraphChallenge Finalist, High Performance Extreme Computing (HPEC) 2018  
together with J. Zhang, D. G. Spampinato, S. McMillan
- 2018           MIT GraphChallenge Finalist, High Performance Extreme Computing (HPEC) 2018  
together with T. M. Low, D. G. Spampinato, A. Kutuluru, U. Sridhar, D. T. Popovici,  
S. McMillan

- 2014 Best Paper Award, High Performance Embedded Computing (HPEC) 2014 together with B. Akin and J. Hoe
- 2014 ACM TODAES Best Paper Award (DAC) 2014 together with P. Milder, J. Hoe, and M. Püschel
- 2013 Best Paper Award, High Performance Embedded Computing (HPEC) 2013 together with Q. Zhu, T. Graf, and L. Pileggi
- 2012 Dean's Early Career Fellowship  
Carnegie Institute of Technology, Carnegie Mellon University, 4 awarded
- 2010 HPC Challenge Class II Award (Most Productive System)  
Member of the winning team, led by Gheorghe Almasi (IBM Research)
- 2009 Best Paper Award, High Performance Embedded Computing (HPEC) 2009 together with D. McFarlin and M. Püschel
- 2009 Best Paper Award, Conference on Domain Specific Languages (DSLWC) 2009 together with D. McFarlin, F. de Mesmay, and M. Püschel
- 2008 Best Paper Award, High Performance Embedded Computing (HPEC) 2008 together with Y. Voronenko and M. Püschel
- 2008 City of Wiener Neustadt Culture Prize (awarded in Science)  
Young Scientist Category (*Foerderpreis*), 2 awarded in 2008
- 2006 Gordon Bell Prize (Peak Performance Award)  
Member of the winning team, led by Francois Gygi (UC Davis)
- 2006 Best Paper Award, International Symposium on Parallel and Distributed Processing and Applications (ISPA) 2006; 2 awarded, chosen out of 80 accepted papers
- 2005 Gordon Bell Prize Finalist  
Member of the team led by Francois Gygi (UC Davis)
- 2003 City of Wr. Neustadt Outstanding Ph.D. Thesis Award
- 2001 City of Wr. Neustadt Outstanding M.Sc. Thesis Award
- 2001 Austrian Computer Society Award (*OCG-Foerderpreis*)  
2 awarded in 2001, for outstanding Master's Thesis in Computer Science
- 1999 Siemens Innovation Award (*Innovationspreis*)

## **FUNDING**

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- 2023-2027 *Code Synthesis for the PRISM Architecture*  
F. Franchetti (CMU PI)  
(UCSD/SRC)
- 2022-2027 *Simulation of the Response of Structural Metals in Molten Salt Environment*  
with Los Alamos National Laboratory (LANL, lead)  
F. Franchetti (CMU PI), T. M. Low (CMU Co-PI)
- 2021-2024 *Bluestone: Program Translation and Synthesis for Extremely Heterogeneous Architectures*  
F. Franchetti (PI), T. M. Low  
DoE

- 2021-2024 *Crossroads (XRD)*  
J. C. Hoe (Carnegie Mellon University, Lead PI), F. Franchetti (CMU, PI), V. Sekar (CMU, PI), J. Sherry (CMU, PI), V. Betz (U of Toronto, PI), D. Chiou (UT Austin, PI), D. Z. Pan (UT Austin, PI)  
INTEL/VMWare
- 2021-2023 *NNTX for PALISADE*  
F. Franchetti (PI), T. M. Low (co-PI), M. Franusich (co-PI)  
DARPA DPRIVE/Duality Technologies/Trebuchet
- 2020-2025 *Unlocking Interactive AI Development for Rapidly Evolving Research*  
P. A. Buitrago (PI), S. Sanielevici (co-PI), F. Franchetti (co-PI)  
NSF
- 2019 *SnowWhite: High-Level Reasoning in Compilers*  
F. Franchetti (PI), M. Franusich, J. C. Hoe, T. M. Low, D. Spampinato  
DARPA PAPP
- 2018-2023 *FFTX: A Co-Design Project for Fast Fourier Transforms (FFTs)*  
F. Franchetti (PI), T. M. Low
- 2018-2021 *Spiral/AIML: Co-optimization for High-Performance, Data-Intensive Computing in Resource-Constrained Environments (SEI-LSI)*  
S. McMillan (PI), F. Franchetti, T. M. Low, J. C. Hoe
- 2018 *Energy Efficient High Performance through Application-Specific Processor/Program Co-Synthesis (EXTENSION)*  
F. Franchetti (PI), J. M. F. Moura, J. C. Hoe, L. Pileggi  
DARPA PERFECT
- 2018 *Building a COTS Benchmark Baseline for Graph Analytics (SEI-LENS)*  
S. McMillan (PI), F. Franchetti  
Carnegie Mellon Software Engineering Institute (SEI)
- 2017-2018 *Automated Code Generation for Future-Compatible, High-Performance Graph Libraries (SEI-LINE)*  
S. McMillan (PI) and F. Franchetti  
Carnegie Mellon Software Engineering Institute (SEI)
- 2017 *Enhancement of MASSIF (Micromechanical Analysis of Stress-Strain Inhomogeneities with Fourier transforms) for Multiscale Simulations of Alloy Microstructure*  
A. D. Rollett (PI), F. Franchetti  
ENGILITY Corporation
- 2016 *Smart Grid in a Room Simulator (SGRS)*  
M. Ilic (PI), and F. Franchetti  
NIST
- 2015 *Generating Hyper-Portable Future-Proof Computational Kernels with SPIRAL*  
F. Franchetti (PI), M. Franusich, J. C. Hoe, T. M. Low, J. M. F. Moura, D. Padua  
DARPA BRASS
- 2015 *Enhancement of FFT-Based Elastic-Visco-Plastic Code for Multiscale Simulations of Alloy Microstructure*  
A. D. Rollet, F. Franchetti  
DoD HPC PETTT
- 2015 *Spiral for Blue Waters*  
F. Franchetti, M. Franusich  
NSF PAID, NCSA Blue Waters

- 2014 *Energy Efficient High Performance through Application-Specific Processor/Program Co-Synthesis – Phase 2*  
F. Franchetti (PI), J.M.F. Moura, J. C. Hoe, L. Pileggi  
DARPA PERFECT
- 2014 *High Assurance Spiral: Scalable and Portable Domain-Specific Control System Synthesis – Phase 2*  
F. Franchetti (PI), J.M.F. Moura, S. Kar, A. Platzer, M. Veloso, D. Padua, J. Johnson  
DARPA HACMS
- 2014 *Spectral Method for Elasto-Viscoplastic Full-Field Deformation as a Test Bed for Testing New Approaches to High Performance Computing*  
A.D. Rollett (PI) and F. Franchetti  
DOD HPC Modernization Program
- 2014 *Toward a Systematic Collection and Processing of Data in Support of Dynamic Monitoring and Decision Systems (DYMONDS) Framework for Implementing Smart Grids*  
M. Ilic (PI), F. Franchetti, A. Rowe  
PITA
- 2013 *Trusted (CMOS) System-on-Chip Design with Self-Healing Piezoelectric MEMS – Phase 2*  
L. Pileggi (PI), G. Fedder, F. Franchetti, G. Piazza  
IARPA
- 2013 *Smart Grid in a Room: A Hybrid Test-Bed Facility for Cyber-Physical Systems (CPS)-Based Standards in Microgrids and Their Interactions with Utility Systems*  
M. Ilic (PI), F. Franchetti, S. Kar, S. Ray  
NIST
- 2012 CUDA Center of Excellence  
K. Fatahalian (PI), R. Whittaker, I. Lane, J. Chong, G. Gibson, O. Mutlu, F. Franchetti
- 2012 *Energy Efficient High Performance through Application-Specific Processor/Program Co-Synthesis*  
F. Franchetti (PI), J.M.F. Moura, J. C. Hoe, L. Pileggi  
DARPA PERFECT
- 2012 *High Assurance Spiral: Scalable and Portable Domain-Specific Control System Synthesis*  
F. Franchetti (PI), J.M.F. Moura, S. Kar, A. Platzer, M. Veloso, D. Padua, J. Johnson  
DARPA HACMS
- 2012 *Trusted (CMOS) System-on-Chip Design with Self-Healing Piezoelectric MEMS*  
L. Pileggi (PI), G. Fedder, F. Franchetti, G. Piazza  
IARPA
- 2012 *Identifying and Removing Barriers to Autovectorization*  
NSF EAGER
- 2011 *Application-Specific Logic in Memory (Year 3)*  
F. Franchetti (PI), J. C. Hoe, L. Pileggi  
SRC (C2S2)
- 2011 *Spiral: Code Synthesis for Higher-Level Application Domain Specific Code Patterns*  
Intel EGC grant
- 2011 *HotBench: An Optimization Workbench for Hotspots*  
NSF SHF Small

- 2011 *Zero Knowledge Control in Smart Grids*  
SRC SGRC Seed Project
- 2010 *PACT 2010 Student Travel Grants*  
F. Franchetti (as PACT Finance Chair), NSF
- 2010 *Spiral for SCC*  
F. Franchetti  
Intel early equipment access grant
- 2010 *Pushing the Limits to Computing: Managing Resources in a Reliable and Efficient Way in Large-Scale Electric Power Grids*  
M. Ilic (PI), F. Franchetti, G. Hug, and R. Negi  
SRC ERI (CMU SGRC)
- 2010 *Application-Specific Logic in Memory (Year 2)*  
F. Franchetti (PI), J. C. Hoe, L. Pileggi, Mark Horowitz  
SRC (C2S2)
- 2010 *Automatic Program Generation for High Performance Data Dependent Applications*  
J. Moura (PI) and F. Franchetti  
ONR
- 2010 *Generating IPP Library Functionality for Larrabee Using SPIRAL (Renewal)*  
F. Franchetti  
Intel Grant
- 2010 *Nvidia Professor Partnership*  
F. Franchetti  
Nvidia Grant
- 2009 *Generating IPP Library Functionality for Larrabee Using SPIRAL (Renewal)*  
F. Franchetti and M. Püschel  
Intel Grant
- 2009 *A Computing Framework for Distributed Decision Making to Ensure Robustness of Complex Man-Made Network Systems: The Case of the Electric Power Networks*  
R. Negi, F. Franchetti, M. Ilic, and O. Mengshoel  
NSF CPS
- 2009 *Application-Specific Logic in Memory*  
F. Franchetti (PI), J. C. Hoe, L. Pileggi, Mark Horowitz  
SRC (C2S2)
- 2009 *From SPIRAL to Silicon: Synthesis of Ultra-High-Performance SAR in End-of-Roadmap CMOS*  
J. C. Hoe (PI), F. Franchetti, L. Pileggi  
SRC (C2S2)
- 2009 *Computer Generation of Multicore Software for Software-Defined Radio*  
J. M. F. Moura (SpiralGen, Inc.), F. Franchetti, and M. Püschel (CMU)  
ONR STTR
- 2009 *Automatic Program Generation for Data-Dependent Applications*  
J. M. F. Moura, F. Franchetti, and M. Püschel  
ONR
- 2008 *Generating IPP Library Functionality for Larrabee Using SPIRAL*  
F. Franchetti and M. Püschel  
Intel Grant

- 2007      *FFT Generation for the Cell Processor*  
F. Franchetti and M. Püschel  
Mercury Computer Systems Inc.
- 2007      *Intelligent HW-SW Compilers for Signal Processing Applications (Phase II)*  
J. Moura (PI), F. Franchetti, J. Hoe, J. Johnson, D. Padua, M. Püschel, M. Veloso  
DARPA DSO
- 2007      *Program Generation for Parallel Platforms*  
M. Püschel (PI) and F. Franchetti  
NSF, CPA
- 2006      *Towards Production Quality Library Generation Using Spiral*  
J. M. F Moura, M. Püschel, and F. Franchetti  
Intel Equipment Grant
- 2006      *Spiral: Automatic Performance Tuning Using Chapel*  
H.P. Zima (PI) and F. Franchetti  
JPL SURP

## **PATENTS**

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1. F. Sadi, L. Pileggi, F. Franchetti, “High Performance Merge Sort with Scalable Parallelization and Full-Throughput Reduction,” United States Patent No. 11,249,720, February 15, 2016.
2. High Performance and Scalable Multi-way Merge Sort using Advanced Comparison and Radix Pre-Sort, provisional patent No. 2019-084, filed on 20-Nov-2018. Pending.
3. F. Franchetti, L. Pileggi, Q. Zhu, “3DIC Memory Chips Including Computational Logic-in-Memory for Performing Accelerated Data Processing,” United States Patent No. 9,286,216 B2, March 15, 2016.
4. F. Franchetti, M. Ilic. “Systems and Methods for Zero Knowledge Control of Smart Grids,” United States Provisional Patent Application Filed, May 5, 2011.

## **PUBLICATIONS**

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### **Book Chapters**

1. Q. Zhu, L. Pileggi, F. Franchetti. “A Smart Memory Accelerated Computed Tomography Parallel Backprojection.” In *From Algorithms to Circuits and System-on Chip Design (VLSI-SoC 2012)*. A. Burg, A. Coskun, M. Guthaus, S. Katkooi, R. Reis (Editors). *IFIP Advances in Information and Communication Technology*, Vol. 418 (pp. 21-44), Springer, Berlin, Heidelberg, 2013.
2. M. Püschel, F. Franchetti, Y. Voronenko. ”Spiral.” *Encyclopedia of Parallel Computing*, D. A. Padua (Editor), 2011.
3. F. Franchetti, M. Püschel. “Fast Fourier Transform.” *Encyclopedia of Parallel Computing*, D. A. Padua (Editor), 2011.

## Journal Papers

1. D. T. Popovici, M. D. Schatz, F. Franchetti, T. M. Low. "A Flexible Framework for Multi-Dimensional DFTs," *SIAM Journal on Scientific Computing (SISC)*, Software and High-Performance Computing, 2020.
2. F. Franchetti, T. M. Low, T. Popovici, R. M. Veras, D. G. Spampinato, J. R. Johnson, M. Püschel, J. C. Hoe, J. M. F. Moura. "Spiral: Extreme Performance Portability." *Proceedings of the IEEE*, Vol. 106, No. 11, 2018. Special Issue on *From High Level Specification to High Performance Code*.
3. F. Franchetti, J. M. F. Moura, D. A. Padua, J. Dongarra. "Scanning the Issue: From High-Level Specification to High-Performance Code." *Proceedings of the IEEE*, Vol. 106, No. 11, 2018. Special Issue on *From High Level Specification to High Performance Code*.
4. F. Franchetti, T. M. Low, S. Mitsch, J. P. Mendoza, L. Gui, A. Phaosawasdi, D. Padua, S. Kar, J. M. F. Moura, M. Franusich, J. Johnson, A. Platzer, and M. Veloso. "High-Assurance SPIRAL: End-to-End Guarantees for Robot and Car Control." *IEEE Control Systems Magazine*, 2017.
5. M. Bolten, F. Franchetti, P. Kelly, C. Lengauer, M. Mohr. "Algebraic Description and Automatic Generation of Multigrid Methods in SPIRAL." *Concurrency and Computation: Practice and Experience*, 2017.
6. B. Akin, F. Franchetti, & J. Hoe. "HAMLeT Architecture for Parallel Data Reorganization in Memory." *IEEE MICRO*, 36(1), 14-23, 2016.
7. Q. Guo, T. Chen, Y. Chen, F. Franchetti. "Accelerating Architectural Simulation Via Statistical Techniques: A Survey." In *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, 35(3), 433-446, 2016.
8. M. M. Sabry Aly, M. Gao, G. Hills, C.-S. Lee, G. Pitner, M. M. Shulaker, T. F. Wu, M. Asheghi, J. Bokor, F. Franchetti, K. E. Goodson, C. Kozyrakis, I. Markov, K. Olukoton, L. Pileggi, E. Pop, J. Rabaey, C. Re, H.-S. Wong, S. Mitra. "Energy-Efficient Abundant-Data Computing: The N3XT 1,000x." *Computer*, 48(12), 24-33, 2015.
9. B. Akin, F. Franchetti, J. C. Hoe. "FFTs with Near-Optimal Memory Access Through Block Data Layouts: Algorithm, Architecture and Design Automation." *Journal of Signal Processing Systems*, 2015.
10. P. A. Milder, F. Franchetti, J. C. Hoe, and M. Püschel. "Computer Generation of Hardware for Linear Digital Signal Processing Transforms." In *ACM Transactions on Design Automation of Electronic Systems*, Vol. 17, No. 2, Article 15, April 2012. *ACM TODAES Best Paper Award 2014*.
11. Q. Li, T. Cui, Y. Weng, R. Negi, F. Franchetti, M. D. Ilic. "An Information-Theoretic Approach to PMU Placement in Electric Power Systems." In *IEEE Transactions on Smart Grid*, 4(1): 446-456, 2013.
12. Q. Zhu, C. Berger, E. L. Turner, L. Pileggi, and F. Franchetti. "Local Interpolation-based Polar Format SAR: Algorithm, Hardware Implementation and Design Automation." In *The Journal of Signal Processing Systems*, Vol. 71, Issue 3, pp. 279-312, Springer, 2012.
13. W. Yu, T. Chen, F. Franchetti, and J. C. Hoe. "High Performance Stereo Vision Designed for Massively Data Parallel Platforms." In *IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)*, Vol. 20, No. 11, pp. 1509-1519, Nov. 2010.
14. F. Franchetti, Y. Voronenko, S. Chellappa, J. M. F. Moura, and M. Püschel. "Discrete Fourier Transform on Multicores: Algorithms and Automatic Implementation." In *IEEE Signal Processing Magazine Special Issue on Signal Processing on "Platforms with Multiple Cores,"* Vol. 26, No. 6, pp. 90-102, 2009.
15. B. R. de Supinski, M. Schulz, V. V. Bulatov, W. Cabot, B. Chan, A. W. Cook, E. W. Draeger, J. N. Glosli, J. A. Greenough, K. Henderson, A. Kubota, S. Louis, B. J. Miller, M. V. Patel, T. E. Spelce, F. H.



Streitz, P. L. Williams, R. K. Yates, A. Yoo, G. Almasi, G. Bhanot, A. Gara, J. A. Gunnels, M. Gupta, J. Moreira, J. Sexton, B. Walkup, C. Archer, F. Gygi, T. C. Germann, K. Kadau, P. S. Lomdahl, W. McLendon, B. Hendrickson, F. Franchetti, S. Kral, J. Lorenz, C. W. Ueberhuber, E. Chow, U. Catalyurek. "BlueGene/L Applications: Parallelism on a Massive Scale." In *International Journal of High Performance Computing Applications*, Vol. 22, No. 1, 2008, pp. 33-51.

16. J. Lorenz, S. Kral, F. Franchetti, C. W. Ueberhuber. "Vectorization Techniques for the Blue Gene/L Double FPU." In *IBM Journal of Research and Development*, Vol. 49, No. 2/3, 2005, pp. 437-446.
17. F. Franchetti, S. Kral, J. Lorenz, C. W. Ueberhuber. "Efficient Utilization of SIMD Extensions." In *Proceedings of the IEEE Special Issue on "Program Generation, Optimization, and Adaptation,"* Vol. 93, No. 2, 2005, pp. 409-425.
18. M. Püschel, J. Moura, J. Johnson, D. Padua, M. Veloso, B. Singer, J. Xiong, F. Franchetti, A. Gacic, Y. Voronenko, K. Chen, R. W. Johnson, N. Rizzolo. "SPIRAL: Code Generation for DSP Transforms." In *Proceedings of the IEEE Special Issue on "Program Generation, Optimization, and Adaptation,"* Vol. 93, No. 2, 2005, pp. 232-275.

### Conference Papers (Fully Reviewed)

1. D. B. Cousins, Y. Polyakov, A. A. Badawi, M. French, A. Schmidt, A. Jacob, B. Reynwar, K. Canida, A. Jaiswal, C. Mathew, A. Ebel, N. Neda, B. Reagen, N. Zhang, F. Franchetti, P. Brinich, J. Johnson, M. Franusich, B. Zhang, Z. Chang, M. Pedram. "TREBUCHET Fully Homomorphic Encryption Accelerator: Phase Two Performance Estimation Results." GOMACTech, 2024.
2. S. Rao, M. A. H. Monil, H. Mankad, J. Vetter, F. Franchetti. "FFTX-IRIS: Towards Performance Portability and Heterogeneity for SPIRAL Generated Code." Proceedings of the Supercomputing Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC), 2023.
3. N. Zhang, A. Ebel, N. Neda, P. Brinich, B. Reynwar, A. G. Schmidt, M. Franusich, J. Johnson, B. Reagen, F. Franchetti. "Generating High-Performance Number Theoretic Transform Implementations for Vector Architectures." IEEE High Performance Extreme Computing Conference (HPEC), 2023.
4. D. Sun, N. Zhang, F. Franchetti. "Optimization and Performance Analysis of Shor's Algorithm in Qiskit." IEEE High Performance Extreme Computing Conference (HPEC), 2023.
5. B. Van Straalen, P. Colella, F. Franchetti, P. Broderick. "FFTX: Next-Generation Open-Source Software for Fast Fourier Transforms." Exascale Computing Project Annual Meeting (ECPAM), 2023.
6. L. Tang, S. Chen, K. Harisrikanth, G. Xu, K. Mai, F. Franchetti. "A High Throughput Hardware Accelerator for FFTW Codelets: A First Look." IEEE High Performance Extreme Computing Conference (HPEC), 2022.
7. A. Kulkarni, J. Kovacevic, F. Franchetti. "A Framework for Low Communication Approaches for Large Scale 3D Convolution." International Conference on Parallel Processing (ICPP), 2022.
8. J. Rivera, F. Franchetti, M. Püschel. "A Compiler for Sound Floating-Point Computations using Affine Arithmetic." International Symposium on Code Generation and Optimization (CGO), 2022.
9. S. Mionis, F. Franchetti, J. Larkin. "Optimized Quantum Circuit Generation with SPIRAL." IEEE High Performance Extreme Computing Conference (HPEC), 2021. *Outstanding Student Paper Award*.
10. P. Oostema, F. Franchetti. "Leveraging High Dimensional Spatial Graph Embedding as a Heuristic for Graph Algorithms." IEEE Workshop on Parallel / Distributed Combinatorics and Optimization (PDCO), 2021.

11. N. Kitai, D. Takahashi, F. Franchetti, T. Katagiri, S. Ohshima, T. Nagai. "An Auto-tuning with Adaptation of A64 Scalable Vector Extension for SPIRAL." International Workshop on Automatic Performance Tuning (iWAPT), 2021.
12. N. Kitai, D. Takahasi, F. Franchetti, T. Katagiri, S. Ohshima, T. Nagai. "Adaptation of A64 Scalable Vector Extension for Spiral." SIGHPC High Performance Computing Conference (HPCC), Japan, 2021.
13. J. Rivera, F. Franchetti, M. Püschel. "An Interval Compiler for Sound Floating Point Computations." International Symposium on Code Generation and Optimization (CGO), 2021.
14. S. Rao, A. Kutuluru, P. Brouwer, S. McMillan, F. Franchetti. "GBTLX: A First Look." IEEE High Performance Extreme Computing Conference (HPEC), 2020. *Outstanding Student Paper Award.*
15. V. Zaliva, I. Zaichuk, F. Franchetti. "Verified Translation Between Purely Functional and Imperative Domain Specific Languages in HELIX." 12th Working Conference on Verified Software: Theories, Tools, and Experiments (VSTTE), 2020.
16. J. Zhang, Y. Lu, D. G. Spampinato, F. Franchetti. "515: FESIA: A Fast and Efficient Set Intersection Approach on Modern CPUs." IEEE International Conference on Data Engineering (ICDE), 2020.
17. A. Kulkarni, J. Kovacevic, F. Franchetti. "Massive Scaling of MASSIF: Algorithm Development and Analysis for Simulation on GPUs." Proceedings of the Platform for Advanced Scientific Computing (PASC), 2020. Association for Computing Machinery, New York, NY, USA, Article 13, 1–10.
18. D. Takahashi, F. Franchetti. "FFTE on SVE: SPIRAL-Generated Kernels." International Conference on High Performance Computing in Asia-Pacific Region (HPCAsia), January 2020, pp. 114-122.
19. F. Sadi, J. Sweeney, T. M. Low, J. C. Hoe, L. Pileggi, F. Franchetti. "Efficient SpMV Operation for Large and Highly Sparse Matrices Using Scalable Multi-way Merge Parallelization." IEEE/ACM International Symposium on Microarchitecture (MICRO), 2019.
20. F. Franchetti, D. G. Spampinato, A. Kulkarni, D. T. Popovici, T. M. Low, M. Franusich, A. Canning, P. McCorquodale, B. Van Straalen, P. Colella. "FFTX and SpectralPack: A First Look." IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC), 2018.
21. V. Zaliva, F. Franchetti. "HELIX: A Case Study of a Formal Verification of High Performance Program Generation." Workshop on Functional High Performance Computing (FHPC), 2018.
22. V. Ruzicka, F. Franchetti. "Fast and Accurate Object Detection in High Resolution 4K and 8K Video Using GPUs." IEEE High Performance Extreme Computing Conference (HPEC), 2018. *Best paper finalist.*
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34. T. Ozturk, C. Stein, R. Pokharel, T. Popovici, F. Franchetti, R. Suter, A. Rollett: "Performance Evaluation, Algorithm Optimization and Sensitivity Analysis of the Spectral Full-Field Deformation Modeling of Polycrystalline Materials." 3rd World Congress on Integrated Computational Materials Engineering. Poster.
35. B. Duff, J. Larkin, M. Franusich, F. Franchetti. "Automatic Generation of 3-D FFTs." 2014 Rice Oil & Gas HPC Workshop. Abstract.
36. T. Cui, F. Franchetti. "A Software Performance Engineering Approach to Fast Transmission Probabilistic Load Flow." IEEE PES General Meeting, July 2013, Vancouver, Canada, Student Poster.
37. H. E. Sumbul, A. Patterson, A. Tazzoli, G. Feeder, F. Franchetti, G. Piazza, and L. Pileggi. "Trusted Split-Fabrication System-on-Chip Design Technology and Methodology." Government Applications & Critical Technology Conference (GOMACTech-13), 2013, Las Vegas, USA.
38. B. Akin, P. Milder, F. Franchetti, J. C. Hoe. "Algorithm and Architecture Optimization for Large Size Two Dimensional Discrete Fourier Transform." In *20th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)*, 2012, Poster.
39. C. Angelopoulos, F. Franchetti, and M. Püschel. "Automatic Generation of FFT Libraries for GPUs." NVIDIA Research Summit at the GPU Technology Conference, 2012, Poster (Abstract reviewed).
40. Q. Zhu, E. L. Turner, C. R. Berger, L. Pileggi, and F. Franchetti. "Application-Specific Logic-in-Memory for Polar Format Synthetic Aperture Radar." In *Proceedings of the High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory, 2011. *Best paper session*.
41. Wei Yu, F. Franchetti, J. C. Hoe, J. M. F. Moura, T. Chen. "Performance Portable Tracking of Evolving Surfaces." In *Proceedings of the High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory, 2011. *Best paper session*.
42. T. Cui and F. Franchetti. "A Monte Carlo Framework for Probabilistic Distribution Power Flow." Seventh Annual CMU Conference on the Electricity Industry, 2011, Poster.
43. C. Angelopoulos, F. Franchetti, and M. Püschel. "DFT Transform on the Fermi (GTX480): Automatic Program Generation." NVIDIA Research Summit at the GPU Technology Conference, 2010, Poster (Abstract reviewed).
44. L. Meng, J. R. Johnson, F. Franchetti, Y. Voronenko, M. Moreno Maza, Y. Xie. "Spiral-Generated Modular FFTs." In *Proceedings of the 4th International Workshop on Parallel Symbolic Computation (PASCO)*, 2010, pp. 169-170.
45. D. McFarlin, F. Franchetti, M. Püschel, "Automatic SIMD Vectorization of Fast Fourier Transforms for the Larrabee and AVX Instruction Sets." In *Proceedings of the 15th Workshop on Compilers for Parallel Computers (CPC)*, 2010.
46. S. Chellappa, F. Franchetti, M Püschel. "FFT Program Generation for the Cell BE." In *Proceedings of the 14th Workshop on Compilers for Parallel Computers (CPC)*, 2009.

47. S. Chellappa, F. Franchetti, and M. Püschel. "High Performance Linear Transform Program Generation for the Cell BE." In *Proceedings of the 2009 High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory.
48. D. McFarlin, F. Franchetti, and M. Püschel. "Automatic Generation of Vectorized Fast Fourier Transform Libraries for the Larrabee and AVX Instruction Set Extension." In *Proceedings of the High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory, 2009. *Best paper award*.
49. S. Chellappa, F. Franchetti, and M. Püschel. "Automatic Linear Transform Program Generation for the Cell BE." *Supercomputing (SC)*, 2008, Poster (Abstract reviewed).
50. F. Franchetti, D. McFarlin, F. de Mesmay, H. Shen, T. Wlodarczyk, S. Chellappa, M. Telgarsky, P. Milder, Y. Voronenko, Q. Yu, J. C. Hoe, J. M. F. Moura, and M. Püschel. "Program Generation with Spiral: Beyond Transforms." In *Proceedings of the High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory, 2008.
51. Y. Voronenko, F. Franchetti, F. de Mesmay, and M. Püschel. "Generating High-Performance General Size Linear Transform Libraries Using Spiral." In *Proceedings of the High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory, 2008. *Best paper award*.
52. P. A. Milder, F. Franchetti, J. C. Hoe, and M. Püschel. "Linear Transforms: From Math to Efficient Hardware." In *Proceedings of Design Automation Conference (DAC) High-Level Synthesis Workshop*, 2008.
53. F. de Mesmay, F. Franchetti, Y. Voronenko, and M. Püschel. "Automatic Generation of Multithreaded Vectorized Adaptive Libraries for Matrix Multiplication." In *Proceedings of the 5th International Workshop on Parallel Matrix Algorithms and Applications (PMAA)*, 2008.
54. Y. Voronenko, F. Franchetti, F. de Mesmay, and M. Püschel. "System Demonstration of Spiral: Generator for High-Performance Linear Transform Libraries." In *Proceedings of the 12th International Conference on Algebraic Methodology and Software Technology (AMAST)*, 2008.
55. F. Franchetti, Y. Voronenko, P. A. Milder, S. Chellappa, M. Telgarsky, H. Shen, P. D'Alberto, F. de Mesmay, J. C. Hoe, J. M. F. Moura, M. Püschel. Domain-Specific Library Generation for Parallel Software and Hardware Platforms. In *Proceedings of the NSF Next Generation Software (NGS) Workshop*, 2008.
56. Peter A. Milder, Franz Franchetti, James C. Hoe, and Markus Püschel. "FFT Compiler: From Math to Efficient Hardware." In *IEEE International High Level Design Validation and Test Workshop (HLDVT)*, November 2007. Invited short paper.
57. P. A. Milder, F. Franchetti, J. C. Hoe, and M. Püschel. "Fast Fourier Transform on FPGA: Design Choices and Evaluation." In *Proceedings of the International Symposium on Field-Programmable Gate Arrays (FPGA)*, 2007.
58. P. D'Alberto, P. Milder, F. Franchetti, J. C. Hoe, M. Püschel, and J. M. F. Moura. "Discrete Fourier Transform Compiler for FPGA and CPU/FPGA Partitioned Implementations." In *Proceedings of the High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory, 2006, on CD-ROM.
59. F. Franchetti, A. Bonelli, E. Chuangsuwanich, Y. J. Lee, J. Lorenz, T. Peter, H. Shen, M. Telgarsky, Y. Voronenko, M. Püschel, J. M. F. Moura, C. W. Ueberhuber. "Parallelism in Spiral." In *Proceedings of Workshop on Programming Models for Ubiquitous Parallelism (PMUP)*, pp. 28-32, 2006.
60. F. Franchetti, Y. Voronenko, M. Püschel. "Spiral: Generating Signal Processing Kernels for New Commodity Architectures." In *Proceedings of EDGE Workshop*, pp. D-49-D-50, 2006.
61. F. Franchetti. "Top Performance in Signal Processing." *International Workshop on Numerical and Symbolic Scientific Computing*, 2003.

62. F. Franchetti. "A Portable Short Vector Version of FFTW." In *Proceeding of the Fourth IMACS Symposium on Mathematical Modelling (MATHMOD 2003)*, Vienna University of Technology, Vol. 2, pp. 1539-1548.
63. F. Franchetti, F. Kaltenberger, C. W. Ueberhuber. "FFT Kernels with FMA Utilization." In *Proceedings of the APLIMAT 2002 Conference*, Department of Mathematics, Slovak University of Technology, Bratislava, pp. 333-339.
64. F. Franchetti, M. Püschel, J. M. F. Moura, C. W. Ueberhuber. "Short Vector SIMD Code Generation for DSP Algorithms." In *Proceedings of the 2002 High Performance Embedded Computing (HPEC)*, MIT Lincoln Laboratory, 2002, on CD-ROM.

## Theses

1. F. Franchetti: *Performance Portable Short Vector Transforms*. Ph.D. Thesis Computational Mathematics, Vienna University of Technology 2003 (Ref.: Prof. Dr. C. W. Ueberhuber, 223 pages.)
2. F. Franchetti: *Short Vector FFTs*. Diploma Thesis Technical Mathematics, Vienna University of Technology 2000 (Ref.: Prof. Dr. C. W. Ueberhuber, 148 pages.)

## PRESENTATIONS

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### Seminars and Workshops

- |             |  |
|-------------|--|
| 2023-Nov-14 | <i>Updates on SPIRAL and LibraryX</i><br>Supercomputing 2023: Nagoya University Booth (Short Talk)<br>Denver, CO   |
| 2021-Sep-27 | <i>SPIRAL: AI for High Performance Code with a Side of FFTX</i><br>Argonne National Lab: APS Computational Seminar<br>Virtual  |
| 2021-Aug-17 | <i>SPIRAL: AI for High Performance Code with a Side of FFTX</i><br>Alphabet Inc.<br>Virtual  |
| 2020 Sep 21 | <i>SPIRAL: AI for High Performance Code with a Side of FFTX</i><br>MIT Fast Code Seminar, Massachusetts Institute of Technology<br>Cambridge, MA   |
| 2020 Feb 19 | <i>SPIRAL, FFTX, and Automating the Optimization of the Fast Fourier Transform</i><br>Invited Opening Keynote at Austrian High-Performance Computing Meeting<br>Institute of Science and Technology Austria (IST Austria)<br>Klosterneuburg, Austria |
| 2020 Feb 14 | <i>FFTX and SpectralPACK</i><br>SIAM Conference on Computational Science and Engineering<br>Seattle, WA  |
| 2019 Nov 18 | <i>FFTX and SpectralPACK</i><br>Supercomputing 2019<br>Denver, CO  |
| 2019 Oct 10 | <i>SPIRAL: AI for High-Performance Code</i><br>Oak Ridge National Laboratory<br>Oak Ridge, TN  |

2019 Oct 4      *HPC: Bridging ECE and DBMI*  
 Department of Biomedical Informatics, University of Pittsburgh  
 Pittsburgh, PA

2019 Sep 5      *FFTX and SpectralPACK*  
 Exascale Computing Project CoPA  
 Santa Fe, NM

2019 Aug 8      *SPIRAL's Operator Language: From Textbook Math to High Performance –  
 With Correctness Guarantees*  
 University of Nagoya, Japan

2019 Jun 17     *FFTX and SpectralPACK: A First Look*  
 University of Vienna, Austria

2019 Jun 18     *SPIRAL's Operator Language: From Textbook Math to High Performance –  
 With Correctness Guarantees*  
 TU Vienna, Austria

2019 Apr 29     *SPIRAL's Operator Language: From Textbook Math to High Performance –  
 With Correctness Guarantees*  
 International Federation for Information Processing (IFIP) Working Group  
 Salem, MA

2019 Mar 1      *FFTX and SpectralPACK: A First Look*  
 SIAM Conference on Computational Science and Engineering  
 Spokane, WA

2018 Nov 13     *SPIRAL, FFTX, and the Path to SpectralPACK*  
 Supercomputing 2018  
 Dallas, TX

2018 Jul 27     *Formal Software Synthesis of Computational Kernels*  
 Advanced Supercomputing Environment (ASE) Seminar  
 University of Tokyo, Tokyo, Japan

2018 Mar 8      *SPIRAL FFT Library Generation and Autotuning*  
 SIAM Conference on Parallel Processing for Scientific Computing  
 Waseda University, Tokyo, Japan

2017 Nov 13     *Specialized, perhaps configurable, hardware and software are necessary to  
 achieve high-performance, scalable data analytics*  
 Invited Panelist, Seventh Workshop on Irregular Applications: Architectures  
 and Algorithms (IA<sup>3</sup>), in conjunction with Supercomputing 2017  
 Denver, CO

2016 July 04     *High-Performance Computing Libraries as Domain-Specific Language*  
 Invited Seminar, Vienna University of Technology, Vienna, Austria

2016 March 16   *Formal Software Synthesis of Computational Kernels*  
 Swanson Engineering Seminar, University of Pittsburgh, Pittsburgh, USA

2015 July 21     *Formal Software Synthesis of Computational Kernels*  
 Sapporo Summer HPC Seminar 2015, Sapporo, Japan

2015 June 08     *SPIRAL: Formal Software Synthesis of Computational Kernels*  
 Programming Languages Lunch Colloquia, UT Austin, Austin, USA

2015 May 27      *Formal Software Synthesis of Computational Kernels*  
 Informatik Department Seminar, Vienna University, Vienna, Austria

- 2015 May 19 *Formal Synthesis of Computational Kernels*  
Rigorous Systems Engineering (RiSE) Seminar, IST Austria, Vienna, Austria
- 2015 May 18 *Formal Software Synthesis of Computational Kernels*  
Computer Languages Seminar, Vienna University of Technology, Vienna, Austria
- 2015 May 07 *Formal Synthesis of Computational Kernels*  
Hybrid Modeling Languages (HyML) @ Rice, Rice University, Houston, USA
- 2015 April 14 *Formal Software Synthesis of Computational Kernels*  
Dagstuhl Seminar 15161 on “Advanced Stencil-Code Engineering”  
Schloss Dagstuhl, Germany
- 2015 April 08 *Formal Software Synthesis of Computational Kernels*  
Faculty Candidate Seminar, Carnegie Mellon University, Pittsburgh, USA
- 2015 March 30 *Introduction to SGRS Multi-Layered Simulation Platform Design*  
The Tenth Anniversary of the Carnegie Mellon University Electricity Conference  
Carnegie Mellon University, Pittsburgh, USA
- 2015 March 18 *Code Generation for Higher Level Spectral Methods with Spiral*  
Invited speaker at SIAM CSE Minisymposium “Streamlining Application  
Performance Portability,” Salt Lake City, USA
- 2014 September 25 *3D-Stacked Logic-in-Memory Hardware for Sparse Matrix Operations*  
BLIS Retreat, UT Austin, Austin, USA
- 2014 August 26 *Near Memory Computing: Spectral and Sparse Accelerators*  
Invited speaker at Multi-Agency SOC Workshop, Denver, USA
- 2014 August 26 *Automatic Performance Tuning: Spiral, FFTW, ATLAS & Friends*  
Invited speaker at Multi-Agency SOC Workshop, Denver, USA
- 2014 July 24 *High Assurance Spiral: Scalable and Performance Portable Domain-Specific  
Control System Synthesis*  
Invited speaker at DARPA HACMS PI meeting, Princeton, USA
- 2014 June 3 *3D-Stacked Logic-in-Memory Hardware for Sparse Matrix Operations*  
PASC’14 Conference  
ETH Zurich
- 2014 May 7 *3D-Stacked Logic-in-Memory Hardware For Sparse Matrix Operations*  
Invited presenter at CMU Future Memory Systems Workshop, Pittsburgh, USA
- 2014 Mar 18 *High Assurance Spiral: Co-Synthesizing Proof and Implementation from High-  
Level Specification*  
Invited speaker at the IFIP WG 2.11 on program generation  
Pittsburgh, USA
- 2014 Feb 20 *Spiral on 京 (K)*  
Invited speaker at Minisymposium “Auto-tuning Technologies for Extreme-Scale  
Solvers,” SIAM PP 2014  
Portland, USA
- 2013 Oct 3 *Black Belt Autotuning: Beyond FFT and DGEMM*  
Invited speaker at Dagstuhl Seminar No. 13401: “Automatic Application Tuning  
for HPC Architectures,” Schloss Dagstuhl, Germany

- 2013 May 13      *SPIRAL: Automating High Quality Software Production*  
Invited speaker at Texas Instruments, Inc., Dallas, TX, USA
- 2013 February 27      *Automatic Generation of Massively Parallel FFTs*  
Invited speaker at 3<sup>rd</sup> AICS International Symposium, RIKEN  
Kobe, Japan
- 2013 January 25      *Spiral: Automatic Generation of Industry Strength Performance Libraries*  
Invited talk at University of Texas, Austin  
Austin, USA
- 2012 July 10      *Automatic Generation of the HPCC Global FFT for BlueGene/Q*  
Invited speaker at SIAM Annual Meeting, Minneapolis, USA
- 2012 April 30      *Spiral: Specialized FFTs at ESSL and FFTW Speed*  
Invited speaker at Early Science April Workshop – “Code for Q”, Chicago, USA
- 2012 April 14      *What Could Deskside Supercomputers Do for the Power Grid?*  
Invited speaker at 8<sup>th</sup> Annual CMU Conference on the Electricity Industry 2012  
Pittsburgh, USA
- 2012 April 11      *Spiral: Library Generation Through Autotuning, Rewriting, and Constraint Solving*  
Invited speaker at Dagstuhl Seminar No. 12152: “Software Synthesis”  
Schloss Dagstuhl, Germany
- 2012 March 8      *SPIRAL: Automating High Quality Software Production*  
Invited talk at Intel Science and Technology Center in Embedded Computing  
(ISTC-EC) Seminar, Pittsburgh, USA
- 2012 February 15      *Spiral: Black Belt Autotuning for Parallel Platforms*  
Invited speaker at SIAM PP’12 workshop “Towards Smart Auto-tuning for HPC:  
The State-of-the-art of Auto-tuning Technologies and Future Directions”  
Savannah, USA
- 2011 September 21      *Spiral: Automatic Generation of Industry Strength Performance Libraries*  
Keynote speaker at High Performance Embedded Computing (HPEC) Workshop  
Lexington, USA
- 2011 September 15      *Spiral: Automating High Quality Software Production*  
Invited Talk at Qualcomm Research, Santa Clara, USA
- 2011 September 12      *Towards Automating Black Belt Programming*  
Invited Talk at IBM T. J. Watson Research Center, Yorktown Heights, USA
- 2011 August 8      *Black Belt Autotuning Beyond FFT and DGEMM*  
CScADS Autotuning Workshop, Tahoe City, USA
- 2011 June 9      *Leveraging Emerging Computer Architectures in Smart Grids*  
Invited speaker at the Second DAC Workshop on  
Smart Grid and Design Automation, San Diego, USA
- 2011 June 2      *Towards Automating Black Belt Programming*  
Keynote talk at The Sixth International Workshop on  
Automatic Performance Tuning (iWAPT), Singapore
- 2011 May 31      *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited talk at National University of Singapore, Singapore

2011 May 24 *Spiral: Computer Generation of Performance Libraries*  
Invited speaker at DARPA Workshop on Program Synthesis for Rapid Software Development, Chicago, USA

2011 April 13 *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited Talk at University of Tennessee, Knoxville  
Knoxville, USA

2011 April 12 *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited Talk at Oak Ridge National Laboratory  
Oak Ridge, USA

2011 March 31 *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited Talk at Vienna University of Technology, Vienna, Austria

2011 March 9 *Trends in High-Performance Computing for Power Grid Applications*  
Invited Talk at 7th Annual CMU Conference on the Electricity Industry 2011  
Pittsburgh, USA

2011 March 8 *CMU Vision for The Newly Formed SRC Smart Grid Research Center*  
7th Annual CMU Conference on the Electricity Industry 2011, Pittsburgh, USA

2011 March 4 *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited talk at Intel Research, Hudson, USA

2011 February 24 *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited talk at Nvidia Research, Sunnyvale, USA

2011 February 21 *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited talk at University of Illinois at Urbana-Champaign, Urbana, USA

2011 February 14 *Spiral: Generating Efficient Programs for Emerging Parallel Platforms*  
Invited talk at Massachusetts Institute of Technology, Cambridge, USA

2011 January 31 *Spiral: Program Generation for Linear Transforms and Beyond*  
Invited talk at Translucent Analytics, Inc., remote presentation

2010 August 9 *The C of My Dreams*  
Presentation at CScADS Autotuning Panel on “Languages and Compilers for Linear Algebra Libraries”, Snowbird, USA

2010 July 8 *Automatic SIMD Vectorization of Fast Fourier Transforms for the Larrabee and AVX ISAs*, Invited speaker at CPC'10, Vienna, Austria

2010 June 23 *Trends in High-Performance Computing for Power Grid Applications*  
FERC Workshop on *Improving Market and Planning Efficiency through Improved Software*, Washington, USA

2010 May 11 *Automatic Generation of SIMD-Vectorized DSP Kernels*  
Invited speaker at Dagstuhl Seminar No. 10191: “Program Composition and Optimization: Autotuning, Scheduling, Metaprogramming and Beyond: Schloss Dagstuhl, Germany

2010 March 15 *Spiral: Program Generation for Linear Transforms and Beyond*  
Invited talk at Georgia Institute of Technology, Atlanta, USA

2010 March 5 *Spiral: Program Generation for Linear Transforms and Beyond*  
Invited talk at Argonne National Laboratory (ANL), Chicago, USA



- 2010 February 8 *SpiralGen: Computer Generation of Performance Libraries*  
Invited talk at Microsoft Corporation, Redmond, USA
- 2009 December 16 *Spiral: Computer Generation of Performance Libraries*  
Invited talk at Pittsburgh Supercomputing Center, Pittsburgh, USA
- 2009 October 22 *Spiral: Computer Generation of Performance Libraries*  
Invited remote presentation, Software-Intensive Systems Producibility (SISPI)  
together with M. Püschel
- 2009 October 21 *Spiral: Program Generation for Linear Transforms and Beyond*  
Invited talk at Mercury Computer Systems Inc., Boston, USA
- 2009 September 18 *Spiral: Computer Generation of Performance Libraries*  
Invited talk at OSD workshop, GMU, Fairfax, USA
- 2009 September 8 *Spiral: Program Generation for Linear Transforms and Beyond*  
Invited talk at Lawrence Livermore National Laboratory (LLNL), Livermore, USA
- 2009 August 25 *Spiral: Program Generation for Linear Transforms and Beyond*  
Invited talk at Information Science & Technology Institute  
Los Alamos National Laboratory (LANL), Los Alamos, USA
- 2009 August 10 *Big Questions in Autotuning*  
Presentation at CSCADS Autotuning Panel on Big Questions, North Tahoe, USA
- 2009 July 7 *SpiralGen: Computer Generation of Performance Libraries*  
Invited presentation at The Technology Collaborative, together with  
Y. Voronenko  
Pittsburgh, USA
- 2009 May 6 *Spiral: Generating Software and Hardware Implementations for Linear  
Transforms*  
Invited talk at University of Delaware ECE Seminar, Newark, USA
- 2009 April 24 *Spiral: Beyond Transforms*  
Invited talk at Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan
- 2009 January 23 *Spiral: Teaching Computers to Write Fast Libraries*  
Invited talk at The MathWorks, Natick, USA
- 2009 January 8 *FFT Program Generation for the Cell BE*  
Invited talk at CPC'09, Zurich, Switzerland.
- 2008 November 17 *Spiral: Generating Parallel Software for Linear Transforms (And Beyond)*  
Invited talk at SC'08 Workshop "Bridging Multicore's Programmability Gap"  
Austin, USA
- 2008 October 10 *Spiral: Generating Software and Hardware Implementations for Linear  
Transforms*  
Invited talk at UC Berkeley, Berkeley, USA
- 2008 August 19 *Parallelism in Spiral*  
Invited remote presentation, AMD Research, Seattle, USA
- 2008 August 6 *Meet Stephanie, the Computer. Spiral: Automatic Library Generation*  
Invited talk at UW MSR Institute 2008, Semiahmoo, USA
- 2008 July 25 *Spiral: Automating Library Development*  
Invited talk at Vanu Inc., together with J. M. F. Moura, Cambridge, USA

- 2008 June 18 *Generating Efficient Programs for Emerging Parallel Platforms*  
Research Faculty Candidate Talk, Carnegie Mellon University, USA
- 2008 May 27 *Spiral: Generating Software and Hardware Implementations for Linear Transforms*  
Invited talk at Ohio State University, Columbus, USA
- 2008 April 13 *Domain-Specific Library Generation for Parallel Software and Hardware Platforms*  
The NSF Next Generation Software (NSFNGS) Workshop 2008, Miami, USA
- 2008 March 14 *Spiral: Tackling Parallelism*  
Invited talk at the workshop “Algorithms and Optimizations Targeting Multi-Core Architectures,” co-located with SIAM PPO8, Atlanta, USA
- 2008 February 14 *Spiral: Tackling Parallelism*  
Invited short presentation at “Future of Concurrency” workshop, Pittsburgh, USA
- 2007 September 4 *Parallelism in Spiral*  
Invited speaker at Dagstuhl Seminar No. 07361:  
“Programming Models for Ubiquitous Parallelism”  
Schloss Dagstuhl, Germany
- 2007 August 27 *Spiral: Automatic Performance Tuning Using Chapel*  
JPL SURP progress report, together with H. P. Zima  
JPL, Pasadena, USA
- 2007 July 25 *Can We Teach Computers To Write Fast Libraries?*  
Invited talk at IBM T. J. Watson Research Center, Yorktown Heights, USA  
together with Markus Püschel
- July 9 2007 *Parallelism in Spiral*  
Invited talk at SciDAC CScADS Summer Workshop on  
Automatic Tuning for Petascale Systems, Snowbird, USA
- 2007 June 20 *Spiral: Tackling Parallelism*  
Invited talk at International AURORA Conference on Scientific Computing 2007  
Vienna, Austria
- 2007 April 6 *Spiral: Generating Software and Hardware Implementations for Linear Transforms*  
Invited talk at Cray Inc., Seattle, USA
- 2007 April 5 *Accelerators: GPUs and FPGAs (Data Parallel Compilation Panel)*  
Presentation at Intel, Inc., Santa Clara, USA
- 2007 February 2 *Joint Runtime/Energy Optimization And Hardware/Software Partitioning Of Linear Transforms*  
Invited speaker at UCLA Workshop on Power-Constrained Multimedia Systems,  
Los Angeles, USA
- 2007 February 1 *Spiral: Generating Parallel Transforms*  
Invited talk at Center for Advanced Computing Research (CACR),  
Caltech, Pasadena, USA
- 2007 January 31 *Generating Software and Hardware Implementations for Linear Transforms*  
Invited talk at Lawrence Livermore National Laboratory, Livermore, USA

- 2006 November 29     *Generating Parallel Transforms Using Spiral*  
Invited talk at Mercury Computer Systems Inc., Boston, USA
- 2006 September 25     *Generating Parallel Transforms Using Spiral*  
Invited talk at Microsoft Research, Seattle, USA  
together with Markus Püschel
- 2005 September 20     *Formal Vectorization of Digital Signal Processing Transforms*  
Faculty candidate talk at Carnegie Mellon University, USA
- 2005 March 8             *Scheduling in SPIRAL*  
Invited speaker at Dagstuhl Seminar No. 05101:  
“Scheduling for Parallel Architectures: Theory, Applications, Challenges”  
Schloss Dagstuhl, Germany
- 2004 October 29         *SPIRAL: Automatic Performance Tuning on the BlueGene/L Supercomputer*  
Invited speaker, BlueGene/L and QCDOC Workshop  
Brookhaven National Laboratory, USA
- 2004 June 5              *High-Performance Computing on BlueGene/L*  
Invited speaker at the AURORA Plenary Meeting  
Strobl, Austria
- 2003 October 14         *FFTs on BG/L-Status and Methods*  
Invited speaker, The Blue Gene/L Applications,  
Algorithms, and Architectures Workshop, Reno, USA
- 2003 September 18      *The Current Status of BG/L Supercomputers*  
Invited talk at Carnegie Mellon University, USA
- 2003 June 17             *Top Performance in Signal Processing*  
Invited speaker at the International Workshop on  
Numerical and Symbolic Scientific Computing, St. Wolfgang, Austria
- 2003 June 2              *Code-Optimierung fuer FFTs und BLAS (in German)*  
Invited speaker, Kolloquium ueber Parallelverarbeitung  
Research Center Juelich, Germany
- 2003 March 19          *FFTs for Blue Gene/L*  
Invited speaker at the LLNL CASC BlueGene/L Workshop  
Lawrence Livermore National Laboratory, USA
- 2002 August 14         *FFTs on BG/L Machines*  
Invited speaker, The Blue Gene/L Applications,  
Algorithms, and Architectures Workshop, Lake Tahoe, USA
- 2002 August 8          *Self-Adaptive DSP Software*  
Invited speaker, The First Self Adapting Numerical Software (SANS) Summit  
Innovative Computing Lab, UTK Knoxville, USA
- 2002 April 29          *High-Performance FFT Software*  
Invited talk, IBM T. J. Watson Research Center, Yorktown, USA
- 2002 March 18         *High-Performance FFT Software*  
Invited talk, Numerical Harmonic Analysis Group (NuHAG)  
Vienna University, Austria
- 2001 August 5          *A SIMD Vectorization of FFTW*  
Invited talk at Vanu Inc., Cambridge, USA

## **TEACHING**

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2024 Spring	18-647: Computational Problem Solving
2023 Spring	18-647: Computational Problem Solving
2021 Fall	18-202: Mathematical Foundations of Electrical Engineering (co-instructor with Carlee Joe-Wong)
2021 Spring	18-647: Computational Problem Solving
2020 Fall	18-202: Mathematical Foundations of Electrical Engineering (co-instructor with Carlee Joe-Wong)
2020 Spring	18-847-G: Special Topics in Computer Systems: Computational Problem Solving for Engineers
2019 Fall	18-202: Mathematical Foundations of Electrical Engineering (co-instructor with Linda Moya)
2019 Spring	18-613: Foundations of Computer Systems
2018 Fall	18-847: Special Topics in Computer Systems: Computing for Engineers
2018 Spring	18-213 / 15-213 / 15-513: Introduction to Computer Systems (co-instructor with Seth Goldstein and Brian Railing)
2017 Fall	18-847: Special Topics in Computer Systems: Computing for Engineers
2017 Spring	18-213 / 15-213 / 15-513: Introduction to Computer Systems (co-instructor with Seth Goldstein)
2016 Fall	18-202: Mathematical Foundations of Electrical Engineering (co-instructor with Tom Sullivan)
2016 Spring	18-213 / 15-213 / 15-513: Introduction to Computer Systems (co-instructor with Seth Goldstein)
2015 Spring	18-213 / 15-213: Introduction to Computer Systems (co-instructor with Seth Goldstein)
	18-847E: Special Topics in Computer Systems: Spiral: Formal Approaches to Hardware & Software Design & Algorithm Verification (co-instructor with J. M. F. Moura)
2014 Fall	18-202: Mathematical Foundations of Electrical Engineering (co-instructor, with J. M. F. Moura)

### **Advisor of ECE PostDocs**

2021-2024	H. Mankad
2018-2019	F. Sadi
2018-2018	T. Popovici
2017-2020	D. Spampinato
2017-2018	R. Veras
2014-2015	Q. Guo
2013-2015	T.-M. Low (ECE Systems Scientist 1/1/2015; currently ECE Associate Research Professor)

## Advisor of ECE PhD students

2023-	F. Quinn
2023-	T. Zhang
2021-	P. Buitrago (together with J. Moura)
2021-	N. Zhang
2020-	E. Tang (together with J. Hoe)
2020-	L. Tang (together with K. Mai)
2019-	S. Rao
2019-	P. Oostema
2015-2020	A. Kulkarni (together with J. Kovačević): <i>An approach for large-scale three-dimensional FFT-based approximate convolutions on GPUs</i>
2014-2020	J. Zhang: <i>Accelerating the Motifs of Machine Learning Applications on Modern Processors</i>
2014-2023	G. Xu (together with J. Hoe): <i>An Approach to Generating Customized Load-Store Architectures</i>
2013-2018	F. Sadi (together with L. Pileggi): <i>Accelerating Sparse Matrix Kernels with Co-Optimized Architecture</i>
2012-2018	T. Popovici: <i>An Approach to Specifying and Automatically Optimizing Fourier Transform Based Operations</i>
2012-2020	V. Zaliva: <i>HELIX: From Math to Verified Code</i>
2011-2017	R. Veras: <i>The Automatic Generation of High-Performance Graph Analytic Code using SPIRAL</i>
2010-2011	D. McFarlin (together with M. Püschel, switched advisor in 2011)
2010-2015	B. Akin (together with J. C. Hoe): <i>A Formal Approach to Memory Access Optimization: Data Layout, Reorganization, and Near-Data Processing</i>
2010-2013	Q. Zhu (together with L. Pileggi, graduated 12/2013): <i>Application Specific Logic in Memory</i>
2009-2013	T. Cui (graduated 11/2013): <i>Power System Probabilistic and Security Analysis using Commodity High Performance Computing Systems</i>
2009-2011	W. Yu (together with J. C. Hoe, graduated 7/2011): <i>Performance Portable Tracking of Evolving Surfaces</i>
2009-2012	C. Angelopoulos (together with M. Püschel, graduated as M.S. in 2012): <i>Automatic Program Generation for GPUs</i>

## Mentor of MS students

2020-	S. Mionis (Computer Science Department)
2016-2019	P. Brouwer (ECE Department)

## External Committee member of PhD students

2021-	P. Brinich, Drexel University
2018-2019	S. Pothukuchi (Co-advised with D. Padua), UIUC, Champaign, Illinois, USA
2017	D. Spampinato (Advisor: M. Püschel), ETH Zurich, Switzerland
2015	LC Meng, Drexel University
2014	T. Grosser (Advisor: A. Cohen), INRIA, France

## External Committee member of MS students

2020	P. Brinich, Drexel University
2013	LC Meng, Drexel University
2009	M. Andrews, Drexel University

## Research with IAESTE interns and PES visiting students

2019	E. Offori-Addo (IAESTE intern)
2018	L. Pfaffenwimmer (IAESTE intern)
2017	V. Ruzicka (IAESTE intern)
2016	D. Herold (IAESTE intern) R. Bergström (IAESTE intern) S. Deviah (PES visiting student)
2015	M. Hrzica: (IAESTE intern) B. Kashyn (PES visiting student)
2014	H. V. Koops: <i>Audio-based self-consistency for cars and robots</i> (IAESTE intern)
2013	C. van den Hauwe: <i>Symbolic execution of Spiral-generated code</i> (IAESTE intern) L. Grimley (visiting student)
2012	B. Vandermissen: <i>Symbolic execution of Spiral-generated code</i> (IAESTE intern)
2011	T. Graf: <i>Sparse Matrix-Matrix Multiplication</i> (IAESTE intern)
2010	R. Veras: <i>The fastest DGEMM possible in Spiral</i> (visiting student) M. M. Goncalves: <i>Graph algorithms in sparse linear algebra formulation</i> (IAESTE intern)
2009	P. Nabais: <i>Program Generation for Boolean Satisfiability</i> (IAESTE intern)
2008	D. Pickem: <i>SPIRAL for the G80 GPU</i> (IAESTE intern 2008; visiting M.S. student 2009) D. Pickem: <i>SPIRAL and Embedded Processors</i> (IAESTE intern, co-advised with M. Püschel) S. Cvijic: <i>Code Generation for Sparse Linear Matrix-Vector Multiplication</i> (IAESTE intern, co-advised with M. Püschel)
2007	L. Dzinevski: <i>SPIRAL and JPEG2000</i> (IAESTE intern, co-advised with M. Püschel) T. Wlodarczyk: <i>SPIRAL and SAR imaging</i> (IAESTE intern, co-advised with M. Püschel)
2006	H. Shen: <i>SPIRAL for GPUs</i> (IAESTE intern, co-advised with J. Moura and M. Püschel) T. Peter: <i>SPIRAL for the Cell BE's SPU</i> (IAESTE intern, co-advised with J. Moura and M. Püschel)

## **PROFESSIONAL ACTIVITIES**

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### Outside Memberships

1. R-CCS Senior Visiting Scientist, Riken, Japan, 2019-Present
2. Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
3. Senior Member, Association for Computing Machinery (ACM)
4. ASciNA President (2014-2019) & Western Pennsylvania Chapter Chair (2010-Present), ASciNA (Austrian Scientists & Scholars in North America)
5. Member, Austrian Computer Society (OCG)
6. Visiting Scientist, RIKEN, Japan, 2013-Present
7. Los Alamos Institute for Reliable High Performance Information Technology (IRHPIT), 2009-Present
8. Participating Guest, Lawrence Livermore National Laboratory, 2003-2007
9. Member, Society for Industrial and Applied Mathematics (SIAM)

## **Editorial Roles**

1. Guest Editor, Proceedings of the IEEE, Special Issue on “From High Level Specification to High Performance Code,” 2018.

## **Outside Committee Chairs**

1. Publicity Chair, International Symposium on Code Generation and Optimization (CGO) 2018
2. Program Committee Topic Co-Chair (“Support Tools & Environments”), Euro-Par 2018
3. CFP Co-Chair and Technical Program Committee Member, High Performance Extreme Computing Conference (HPEC) 2016
4. Global Topic Chair, Euro-Par 2015
5. CFP Co-Chair and Technical Program Committee Member, IEEE HPEC, 2015
6. Chair, Program Committee, 9th International Workshop on Automatic Performance Tuning (iWAPT), 2014
7. Vice Chair, Program Committee, Auto-Tuning for Multicore and GPU (ATMG), 2013
8. Vice Chair, Program Committee, 8th International Workshop on Automatic Performance Tuning (iWAPT), 2013
9. Publicity chair, Fifteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2010
10. Finance chair, Parallel Architectures and Compilation Techniques (PACT), 2010
11. Publicity co-chair, 23rd International Conference on Supercomputing (ICS), 2009

## **Carnegie Mellon Memberships, Committees, and Chairs**

1. Chair, CIT Computing Committee, College of Engineering, Carnegie Mellon, 2019-Present
2. Co-Director, Electric Energy Systems Group, Electrical and Computer Engineering, Carnegie Mellon, 2015-2018
3. Scott Institute, Carnegie Mellon University
4. Center for Sensed Critical Infrastructure Research (CenSCIR), ICES, Carnegie Mellon University
5. Carnegie Mellon SRC Smart Grid Research Center (SGRC)
6. Computer Architecture Lab at Carnegie Mellon (CALCM), Carnegie Mellon University
7. Center for Circuits and System Solutions (C2S2), Carnegie Mellon University
8. CyLAB, Carnegie Mellon University
9. CIT Global Campus Integration Committee, Carnegie Mellon University, since 2014
10. Chair, ECE Future Computation and Communication Task Force, Carnegie Mellon University, since 2014
11. Thrust Leader, Thrust 4 (Security), Carnegie Mellon SRC Smart Grid Research Center (SGRC), 2011-2013
12. Graduate Admissions Committee (GAC), ECE Department, Carnegie Mellon University, 2011-2013
13. Graduate Studies Committee (GSC), ECE Department, Carnegie Mellon University, 2007-2011, 2013-2014
14. Faculty Senator, ECE Department, Carnegie Mellon University, 2011-2013

## Professional Committees

1. Mini-symposium Co-organizer, SIAM Conference on Parallel Processing for Scientific Computing (PP22) 2022
2. Technical Committee (Algorithms Track), IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2021
3. Technical Program Committee (Algorithms Track), International Conference on Parallel Processing (ICPP) 2020
4. Program Committee Member, Workshop on Programming Models for SIMD/Vector Processing (WPMVP) 2020
5. Program Committee Member, International Symposium on High-Level Parallel Programming and Applications (HLPP) 2019
6. Program Committee Member (Algorithms Track), International Conference on Parallel Processing (ICPP) 2019
7. Program Committee Member, Optimization, Modeling, Analysis, and Space Exploration (OMASE) Workshop 2019
8. Program Committee Member, Workshop on Programming Models for SIMD/Vector Processing (WPMVP) 2019
9. Program Committee Member, International Conference on Compiler Construction (CC) 2018
10. Program Committee Member, International Workshop on Numerical Software Verification (NSV) 2018
11. Program Committee Member, Workshop on Programming Models for SIMD/Vector Processing (WPMVP) 2018
12. Program Committee Member, 4th ACM SIGPLAN International Workshop on Libraries, Languages and Compilers for Array Programming (ARRAY) 2017
13. Technical Program Committee Member, IEEE HPEC, 2017
14. Program Committee Member, 26<sup>th</sup> International Conference on Parallel Architectures and Compilation Techniques (PACT) 2017
15. Program Committee Member, 38<sup>th</sup> ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI) 2017
16. Program Committee Member, 2<sup>nd</sup> International Workshop on Post Moore's Era Supercomputing (PMES) 2017
17. Technical Program Committee, Seventh International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing (WOLFHPC) 2017
18. Member, Carnegie Mellon University ECE Department Undergraduate Advising Committee (UAC) 2016
19. Program Committee Member, Auto-Tuning for Multicore and GPU (ATMG) 2016
20. Organizing Committee, BLIS (BLAS-like Library Instantiation Software) Retreat 2016
21. Workshop Organizing Committee Member, Post-Moore's Era Supercomputing (PMES) Workshop 2016
22. Technical Program Committee, Sixth International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing (WOLFHPC) 2016
23. Program Committee Member, Workshop on Programming Models for SIMD/Vector Processing (WPMVP) 2016
24. Program Committee Member, 20<sup>th</sup> International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS) 2015
25. Program Committee Member, Auto-Tuning for Multicore and GPU (ATMG) 2015



26. Program Committee Member, Workshop on Exascale Multi/Many Core Computing Systems (E-MuCoCos) 2015
27. Technical Program Committee, Fifth International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing (WOLFHPC) 2015
28. Program Committee Member, Workshop on Programming Models for SIMD/Vector Processing (WPMVP) 2015
29. Organizing Committee, BLIS (BLAS-like Library Instantiation Software) Retreat 2014
30. Program Committee, 26<sup>th</sup> International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD) 2014
31. Technical Program Committee, Fourth International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing (WOLFHPC) 2014
32. Technical Committee, 18<sup>th</sup> IEEE High Performance Extreme Computing Conference (HPEC) 2014
33. Technical Program Committee, 20<sup>th</sup> IEEE Int. Conference on Parallel and Distributed Systems (ICPADS-2014)
34. Program Committee, 7<sup>th</sup> Int. Workshop on Multi-/Manycore Computing Systems (MuCoCoS), 2014
35. Program committee, IFIP International Conference on Network and Parallel Computing (NPC 2014)
36. External Program Committee, Parallel Architectures and Compilation Techniques (PACT) 2014
37. External Review Committee, Programming Design Language and Implementation (PDLI), 2014
38. Technical Committee, IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2014
39. Program Committee, Special Session: Auto-Tuning for Multicore and GPU (ATMG), 2014
40. Program Committee, 19<sup>th</sup> International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS) 2014
41. Program Committee, ACM International Conference on Supercomputing (ICS), 2014
42. Program Committee, Workshop on Programming Models for Vector Processing (WPMVP), 2014
43. Program Committee, International Conference on Parallel Computing (ParCo), 2013
44. Program Committee, 6<sup>th</sup> Int. Workshop on Multi-/Manycore Computing Systems (MuCoCoS), 2013
45. Program Committee, 10<sup>th</sup> International Conference on Parallel Processing and Applied Mathematics (PPAM), 2013
46. Program Committee, 27<sup>th</sup> International Parallel and Distributed Processing Symposium (IPDPS), 2013
47. Program Committee, 24<sup>th</sup> International Symposium on Computer Architecture & High Performance Computing (SBAC-PAD), 2012
48. Program Committee, The Seventh International Workshop on Automatic Performance Tuning (iWAPT), 2012
49. Program Committee, Special Session: Auto-Tuning for Multicore and GPU (ATMG)
50. Program Committee, 2012 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS), 2012
51. Study member, DARPA ISAT study on Program Synthesis, 2011
52. Program Committee, International Conference on Parallel Computing (ParCo), 2011
53. Program Committee, Workshop on Exploitation of Hardware Accelerators (WEHA), 2011
54. Program Committee, High Performance Embedded Architectures & Compilers (HiPEAC), 2011
55. Program Committee, The Fifth International Workshop on Automatic Performance Tuning (iWAPT), 2010

56. Program Committee, Workshop on Exploitation of Hardware Accelerators (WEHA), 2010
57. Program Committee, Parallel Architectures and Compilation Techniques (PACT), 2010
58. Program Committee, 23rd International Conference on Supercomputing (ICS), 2009
59. Program Committee, SMART'09: 3rd Workshop on Statistical and Machine learning approaches to Architectures and compilaTion
60. Program Committee, 13th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS) 2008, Miami, Florida
61. Program Committee, The Seventeenth International Conference on Parallel Architectures and Compilation Techniques (PACT) 2008, Toronto, Canada

## **Review Activities**

1. Reviewer, US Department of Energy's (DOE's) Exascale Computing Project (ECP), 2016
2. Reviewer, Transactions on Computer Systems, 2014-15
3. Board of Distinguished Reviewers, ACM Transactions on Architecture and Code Optimization (TACO) 2014-15
4. NSF Review Panel
5. Ohio Supercomputer Center Grant Review
6. Proceedings of the IEEE, Special Issue on "Program Generation, Optimization, and Platform Adaptation"
7. IEEE Embedded Systems Letters (ESL)
8. IEEE Transactions on CAD of Integrated Circuits and Systems (TCAD)
9. IEEE Signal Processing Letters (SPL)
10. IEEE Transactions on Image Processing (TIP)
11. IEEE Transactions on Signal Processing (TSP)
12. IEEE Micro
13. ACM Transactions on Mathematical Software (TOMS)
14. ACM Transactions on Architecture and Code Optimization (TACO)
15. Springer Journal of "Signal, Image and Video Processing"
16. Special Issue of the Parallel Processing Letters
17. Information Processing Letters (IPL)
18. IEEE Proceedings - Vision, Image and Signal Processing
19. Parallel Computing (PARCO)
20. Scientific Programming Special Issue of "Scientific Programming on Cell B.E. Processor"
21. Journal of Computers & Electrical Engineering (COMPELECENG)
22. Journal of Parallel and Distributed Computing (JPDC)
23. IBM Journal of Research and Development
24. Journal of "Software: Practice and Experience"
25. Journal of Computer Science and Technology (JCST)
26. Transactions on Computers (TC)
27. International Parallel and Distributed Processing Symposium (IPDPS) 2002

28. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2002
29. The Fifteenth Annual ACM Symposium on Parallelism in Algorithms and Architectures 2003
30. The 31st Annual International Symposium on Computer Architecture (ISCA) 2004
31. IEEE International Conference on Image Processing (ICIP) 2005, 2006
32. Workshop on Languages and Compilers for Parallel Computing (LCPC) 2007
33. ACM SIGPLAN 2008 Workshop on Partial Evaluation and Program Manipulation (PEPM) 2008
34. The 13th Internat'l Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS) 2008
35. International Conference on High Performance Computing (HiPC 2008)
36. ACM International Conference on Computing Frontiers (CF) 2008
37. The 2008 European Signal Processing Conference (EUSIPCO) 2008
38. The 17th International Conference on Parallel Architectures and Compilation Techniques (PACT) 2008
39. International Conference on Compiler Construction (CC 2009)
40. ACM International Conference on Supercomputing (ICS) 2009
41. 3rd Workshop on Statistical and Machine learning approaches to Architectures and compilaTion (SMART) 2009
42. The 17th European Signal Processing Conference (EUSIPCO) 2009
43. The International Conference on Parallel Processing (ICPP) 2009
44. IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS) 2010
45. IEEE International Symposium on High-Performance Computer Architecture Conference (HPCA) 2010
46. IEEE International Symposium on Circuits and Systems (ISCAS) 2012
47. IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS) 2012
48. The Seventh International Workshop on Automatic Performance Tuning (iWAPT), 2012

## **FELLOWSHIPS**

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|------------|---|
| 2004-2005  | Erwin Schroedinger Fellowship<br><i>Advanced Code Generation in Digital Signal Processing</i><br>funded by the Austrian Science Fund FWF<br>enables post-doctoral research abroad at top institutions (invitation required)<br>2 two-year awards in 2003 in the Faculty of Technical Sciences and CS, TU Vienna |
| 2002       | Lower Austria's award for excellent collegiate performance ( <i>Top-Stipendium</i> )  |
| 1998, 2000 | Research fellowships, AURORA Project 5 (Advanced Scientific Computing Team)<br>funded by the Austrian Science Fund FWF  |
| 1998, 1999 | Vienna University of Technology annual award for student achievement<br>( <i>Leistungsstipendium</i> )  |
| 1997-2000  | Member of the Siemens Student Fellowship Program ( <i>Studentenkreis</i> )<br>for selected, highly qualified students in Engineering and Sciences   |

## **OTHER**

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Native language German, fluent in English

Playing electric guitar since 1993; on stage in various local rock bands, blues jams, and the ECE Rock Band; stage manager and technician at the yearly Austrian 1,200+ guests newcomer rock festival SCHMU ([www.schmu.at](http://www.schmu.at)) from 1993-2004