

Vasileios Karakasis

Electrical and Computer Dipl.-Ing., Ph.D.
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Tel.: +30 21 0772 2133 ext. 420
Nationality: Greek (EU)
Date of birth: 05/04/1982

Education

2006–2012 COMPUTING SYSTEMS LAB., N.T.U.A.

Ph.D. Thesis

"Optimizing the Sparse Matrix-Vector Multiplication Kernel for Modern Multicore Computer Architectures"

In-depth performance evaluation of the Sparse Matrix-Vector Multiplication kernel (SpMV) in modern multicore architectures; architectural interactions in blocked storage formats; performance models for SpMV; introduction of the Compressed Sparse eXtended (CSX) format and evaluation in 'production' multiphysics software; energy efficiency considerations on SpMV and prediction models.

Advisor: N. Koziris

2000–2005 SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING, N.T.U.A.

Diploma in Electrical and Computer Engineering

Graduated, GPA: 8.58/10

Diploma thesis on intelligent data mining techniques using Artificial Immune Systems.

Advisor: A.-G. Stafylopatis

2000 Graduated from High School, GPA: 19.6/20

Professional Experience

2013 HELLENIC ARMY

IT Administrator – Military Service

2011–2012 COMPUTING SYSTEMS LAB., N.T.U.A.

PRACE EU project

Integration of the CSX sparse matrix storage in the Elmer multiphysics software as part of the "Partnership for Advanced Computing in Europe (PRACE)" project.

2009 COMPUTING SYSTEMS LAB., N.T.U.A.

PRACE EU project

Evaluation on modern microarchitectures of a machine learning-based compiler flag optimizer as part of the "Partnership for Advanced Computing in Europe (PRACE)" project.

2008– Independent consulting in software development (C/C++), high-performance software optimizations, and systems administration.

2006–2007 DIRECTING

Software Engineer

Design and implementation of a data mining suite.

2005–2006 COMPUTING SYSTEMS LAB., N.T.U.A.

Research Assistant

Optimization of High-Performance PDE applications using tiling transformations.

Academic Experience

- 2010–2012** SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING, N.T.U.A.
Teaching Assistant
“Parallel Processing Systems” course (3.4.53.9), 9th semester.
Introductory lecture in GPU programming and supervision of a related project.
- 2010** GREEK RESEARCH & TECHNOLOGY NETWORK (GRNET) S.A.
EGEE-III Trainer
Series of introductory lectures on MPI application programming as part of the EGEE-III seminars
“Issues on Grid Technologies”.
- 2008–2012** SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING, N.T.U.A.
Teaching Assistant
“Operating Systems Laboratory” course (3.4.35.8), 8th semester.
- 2008–2011** SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING, N.T.U.A.
Teaching Assistant
“Operating Systems” course (3.4.22.7), 7th semester.
- 2006–2008** SCHOOL OF ELECTRICAL AND COMPUTER ENGINEERING, N.T.U.A.
Teaching Assistant
“Computer Programming” course (3.4.01.1), 1st semester.

Professional & Academic Memberships

- Member of the European Network of Excellence on High Performance and Embedded Architecture and Compilation, HiPEAC, (2009).
- Member of the Institute of Electrical and Electronics Engineers, IEEE, (2007).
- Member of the Technical Chamber of Greece, TEE-TCG, (2006).

Skills

Technical skills

- Programming languages: C/C++, LLVM, Clang, Java, Python, Bash, Awk, M4, Fortran 77/90, Pascal.
- Concurrent programming: OpenMP, MPI, Cilk, POSIX threads, CUDA, OpenCL.
- Microarchitectures: Intel, AMD, nVidia
- Systems programming: UNIX/Linux, Linux kernel.
- Operating Systems: UNIX-like systems (especially Linux), Windows.
- Systems administration: Linux servers (security, backups, user policies, etc.), MS Windows 2008 Server.
- Web technologies: HTML, XML, JSP, Java servlets, Javascript, AJAX, RESTful, cloud computing
- Database technologies: SQL, SQLite, MS SQL Server.
- Build systems: GNU Autotools, MS Visual Studio, Eclipse, Git, Svn
- Other: L^AT_EX typesetting system, MS Office.

Languages

- Greek: Native.
- English: C2 (Cambridge Proficiency in English).
- French: C2 (Diplôme Approfondi de Langue Française (DALF) I–IV).
- German: C2 (Kleines Deutsches Sprachdiplom).

Referees

Referee #1

Name: Nectarios Koziris, Associate Prof.
Organization: School of ECE, NTUA, GR
E-mail: nkoziris@cslab.ece.ntua.gr
Website: <http://www.cslab.ece.ntua.gr/~nkoziris>
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Referee #2

Name: Andreas Stafylopatis, Prof.
Organization: School of ECE, NTUA, GR
E-mail: andreas@cs.ntua.gr
Phone: +30-210-772-2508

Referee #3

Name: Georgios Goumas, Lecturer
Organization: School of ECE, NTUA, GR
E-mail: goumas@cslab.ece.ntua.gr
Website: <http://www.cslab.ece.ntua.gr/~goumas>
Phone: +30-210-772-2402

Publications

1. J. C. Meyer, V. Karakasis, J. Cebrián, L. Natvig, D. Siakavaras, and K. Nikas. Energy-efficient sparse matrix autotuning with CSX – A trade-off study. In *Ninth Workshop on High-Performance, Power-Aware Computing (HPPAC'13), IPDPS'13*, pages 931–937, Boston, MA, USA, 2013. IEEE.
2. T. Gkountouvas, V. Karakasis, K. Kourtis, G. Goumas, and N. Koziris. Improving the performance of the symmetric sparse matrix-vector multiplication in multicore. In *27th IEEE International Parallel & Distributed Processing Symposium (IPDPS'13)*, pages 273–283, Boston, MA, USA, 2013. IEEE.
3. V. Karakasis, T. Gkountouvas, K. Kourtis, G. Goumas, and N. Koziris. An extended compression format for the optimization of sparse matrix-vector multiplication. *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 24(10):1930–1940, 2013.
4. V. Karakasis, G. Goumas, K. Nikas, N. Koziris, J. Ruokolainen, and P. Råback. Using state-of-the-art sparse matrix optimizations for accelerating the performance of multiphysics simulations. In *PARA 2012: Workshop on State-of-the-Art in Scientific and Parallel Computing*, Helsinki, Finland, 2012. Springer.
5. V. Karakasis, G. Goumas, and N. Koziris. Exploring the performance-energy tradeoffs in sparse matrix-vector multiplication. In *Workshop on Emerging Supercomputing Technologies (WEST), ICS'11*, Tucson, AZ, USA, 2011.
6. K. Kourtis, V. Karakasis, G. Goumas, and N. Koziris. CSX: An extended compression format for SpMV on shared memory systems. In *16th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP'11)*, San Antonio, TX, USA, 2011. ACM.
7. V. Karakasis, G. Goumas, and N. Koziris. Performance models for blocked sparse matrix-vector multiplication kernels. In *38th International Conference on Parallel Processing (ICPP'09)*, pages 356–364, Vienna, Austria, 2009. IEEE Computer Society.
8. V. Karakasis, G. Goumas, and N. Koziris. A comparative study of blocking storage methods for sparse matrices on multicore architectures. In *12th IEEE International Conference on Computational Science and Engineering (CSE-09)*, Vancouver, Canada, 2009. IEEE Computer Society.
9. V. Karakasis, G. Goumas, and N. Koziris. Exploring the effect of block shapes on the performance of sparse kernels. In *10th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC-09), IPDPS'09*, pages 1–8, Rome, Italy, 2009. IEEE Computer Society.
10. G. Goumas, K. Kourtis, N. Anastopoulos, V. Karakasis, and N. Koziris. Performance evaluation of the sparse matrix-vector multiplication on modern architectures. *The Journal of Supercomputing*, 50(1):36–77, 2009.

11. G. Goumas, K. Kourtis, N. Anastopoulos, V. Karakasis, and N. Koziris. Understanding the performance of sparse matrix-vector multiplication. In *Proceedings of the 16th Euromicro Conference on Parallel, Distributed and Network-Based Processing (PDP'08)*, Toulouse, France, 2008. IEEE Computer Society.
12. A. Lanaridis, V. Karakasis, and A. Stafylopatis. Clonal selection-based neural classifier. In *8th International Conference on Hybrid Intelligent Systems (HIS'08)*, pages 655–660, Barcelona, Spain, 2008. IEEE Computer Society.
13. V. Karakasis and A. Stafylopatis. Efficient evolution of accurate classification rules using a combination of gene expression programming and clonal selection. *IEEE Transactions on Evolutionary Computation*, 12(6):662–678, 2008.
14. G. Goumas, N. Drosinos, V. Karakasis, and N. Koziris. Coarse-grain parallel execution for 2-dimensional PDE problems. In *8th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing (PDESEC-07), IPDPS'07*, pages 1–8, Long Beach, CA, USA, 2007. IEEE.
15. V. Karakasis and A. Stafylopatis. Data mining based on gene expression programming and clonal selection. In *IEEE Congress on Evolutionary Computation (CEC 2006)*, pages 514–521, Vancouver, BC, Canada, 2006. IEEE.