

**GUANG R. GAO**

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Department of Electrical and Computer Engineering  
140 Evans Hall  
Newark, DE 19716  
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<http://www.capsl.udel.edu/~ggao/>

***EDUCATION***

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- PhD** Degree in *Electrical Engineering and Computer Science*  
Massachusetts Institutes of Technology, August 1986.  
Member of Computational Structures Group at Laboratory of Computer Science, MIT,  
June 1982 to August 1986.
- MS** Degree in *Electrical Engineering and Computer Science*  
Massachusetts Institutes of Technology, June 1982.
- BS** Degree in *Electrical Engineering*  
Tsinghua University, Beijing.

***PROFESSIONAL EXPERIENCE***

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**University of Delaware**

Newark, DE, USA.

Endowed Distinguished Professor, Department of Electrical and Computer Engineering,  
effective from Sept. 1<sup>st</sup>, 2005.

**University of Delaware**

Newark, DE, USA.

Professor, Department of Electrical and Computer Engineering, Sept. 1996 – Present.  
Founder and leader of the Computer Architectures and Parallel Systems Laboratory  
(CAPSL).

**McGill University**

Montreal, Canada

Associate Professor, School of Computer Science, Jun. 1992 - Aug. 1996.

Assistant Professor, School of Computer Science, Aug. 1987 - Jun. 1992.

Founder and leader of the Advanced Compilers, Architectures and Parallel Systems Group  
(ACAPS) at McGill since 1988.

**Center of Advanced Studies, IBM Toronto Lab**

Aug. 1993 - Jun. 1994.

Visiting scientist with a NSERC Senior Industrial Fellowship.

**Philips Research Laboratories**

Sept. 1986 - Jun. 1987.  
Briarcliff Manor, NY, US.  
Senior member of research staff of the Computer Architecture and Programming Systems Group. Played a major role in founding a multiprocessor system project, and research in parallelizing compilers.

#### **Massachusetts Institutes of Technology**

Jun. 1994 - Aug. 1994  
Visiting Professor (Sabbatical)  
Jun. 1980 - Aug. 1986  
Member of the Computational Structures Group at the Laboratory of Computer Science, MIT.  
Participated in the MIT Static Dataflow Architecture Project and other projects. Proposed a novel methodology of organizing array operations to exploit the fine-grain parallelism of dataflow computation models. Developed a unique pipelined code mapping scheme for dataflow machines (later known as dataflow software pipelining).

#### ***CURRENT RESEARCH AREAS***

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- Computer Architecture and Parallel Systems.
- Optimizing and Parallelizing Compilers.
- Runtime systems.
- Applications: Bio-Informatics and High Performance Computing.

#### ***PROFESSIONAL MEMBERSHIP***

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Senior Member of IEEE, Member of ACM, ACM-SIGARCH, ACM-SIGPLAN.

#### ***NATIONAL AND INTERNATIONAL RECOGNITION***

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- ACM Fellow.
- IEEE Fellow.
- IEEE Computer Society Distinguished Visitor, 1998-2001.
- Elected as a chairman of a collection of well recognized international conferences in computer/information sciences and engineering (see list).
- Invited as a Keynotes Speaker of a number of recognized international conferences (e.g. IPDPS 2005, HiPC2005, IWOMP2006, NPC2007, GCC2009).
- Elected as a Distinguished Professor of Electrical and Computer Engineering – with a Named Professorship at University of Delaware.

#### ***CITATIONS AND SPECIAL APPOINTMENTS***

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- Citation from IEEE Fellowship: For contributions to multiprocessor computers and compiler optimization techniques.
- Citations from ACM Fellowship: For contributions to architecture and compiler technology of parallel computers.

- Gao's publications have been cited widely in his field. For example, there are well over 500 citations for his top 5 most cited papers. Gao's work has attracted the attention of many researchers in diverse application areas. The impact of his work is apparent through the impact of his work in his areas and several modifications and extensions from of the approaches and algorithms pioneered by his work.

He has many special appointments – most are evident on the list of recognized international conferences where he has been appointed as chairman or technical program committee members, or editorships on prestigious journal as listed below.

He also has received honorable appointments. For example, he has served as a panelist of many international conference panels and National Science Foundation grant review panels, external Ph.D thesis examiners both within US and internationally (detailed list can be submitted on request). He also held honorable special visiting professorships in several universities in China – especially the prestigious Tsinghua University (since 2007).

Most recently, he has been invited to server in an international review panel in Computer Science field of Tsinghua University (together with 4 other internationally well recognized computer scientists – holding prestigious titles such National Academy of Engineering (NAE) member, AAAS Fellow, Royal Academy of Engineering Fellow, Founder member of the Scientific Council of the European Research Council)

#### ***CONFERENCE COMMITTEE CHAIRMANSHIP***

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- Advisor Board, International Conference on Parallel Processing (Europar'12)
- Program Chairman of the 40th International Conference on Parallel Processing (ICPP'11), Taipei, Taiwan.
- Panel Coordinator, International Conference on Parallel Architectures and Compiler Technology (PACT 2011); Data-Flow Execution Models for Extreme Scale Computing (DFM 2011).
- Advisor Board, International Conference on Parallel Processing (Europar'11)
- Program Co-Chair of the 22nd Workshop on Language and Compilers for Parallel Computing (LCPC'10), Oct 2009 in Newark, DE, USA,
- Program Co-Chair of IFIP International Conference on Network and Parallel Computing (NPC'09), October 19 to 21, 2009 in Gold Coast, Australia
- Vice Program Chairman of the 36th International Conference on Parallel Processing (ICPP'07), September 10-14, 2007 in XiAn China
- Program Chairman of International Workshop on OpenMP (IWOMP'2007), June 3rd - June 7th, 2007 in Beijing, China
- General Chair of International Conference on Embedded and Ubiquitous Computing (EUC'04), August 26-28, 2004 in Aizu, Japan
- Program Co-Chair of IFIP International Conference on Network and Parallel Computing (NPC'04), Oct 18 - 20, 2004 in Wuhan, China
- Program Vice-Chair of International Parallel & Distributed Processing Symposium (IPDPS'04), April 30, 2004 in Santa Fe, New Mexico
- Program Vice-Chair of International Conference on High Performance Computing (HiPC'01), Dec 17 - 20, 2001 in The Taj Krishna in Hyderabad, India
- Program Co-Chair of the Compilers, Architectures and Synthesis for Embedded Systems (CASES'01), November 16 - 17, 2001 in Atlanta, Georgia, USA
- Chair of the Third Workshop on Petaflop Computing, Feb. 1999 in Annapolis, MD.
- Co-Chair of the Multithreaded Architecture Workshop, in Conjunction to HPCA'99, Jan. 1999 in Orlando, Florida

- General Co-Chair of the 1998 International Conference on Parallel Architectures and Compilation Techniques (PACT'98), Oct. 1998 in Paris, France., co-sponsored by IFIP and IEEE Computer Society
- Co-Chair of the Compiler and Architecture Support for Embedded Systems (CASES'98, 99), in Washington D.C.
- Program Chairman of the 1994 International Conference on parallel Architectures and Compilation Techniques (PACT'94), Aug. 1994 in Montreal, Canada.

### ***JOURNAL EDITORSHIP***

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- Editorial Board of Journal of Chinese Computer Research and Development (2005 - ).
- Editorial Board of the Journal of Embedded Computing (2004 - ).
- Editorial Board of the International Journal of High Performance Computing and Networking (2003 - ).
- Parallel Processing Letters (2001 - ).
- Editorial Board of IEEE Transactions on Computers (1998 - 2001).
- Editorial Board of IEEE Concurrency Journal (1997 - 2000).
- Editorial Board of the Journal on Programming Languages in Jan. 1996, and subsequently became one of the two Co-Editors of the journal (1997-1998).
- Guest Editor for the Special Issue on IEEE Transaction on Computers, Journal of Parallel and Distributed Computing, etc.

### ***PROGRAM COMMITTEE MEMBERS OF RECOGNIZED INTERNATIONAL CONFERENCES***

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- International Conference of Parallel Processing (ICPP'12).
- International Conference on Parallel Architectures and Compiler Technology (PACT 2012); Data-Flow Execution Models for Extreme Scale Computing (DFM 2011, 2012).
- IFIP International Conference on Network and Parallel Computing (NPC'04, 05, 06, 09, 10, 11, 12)
- International Workshop on Languages and Compilers for Parallel Computing (LCPC 2010, 2011, 2012).
- International Symposium on Code Generation and Optimization (CGO'11, CGO'12).
- International Workshop on OpenMP (IWOMP'06, 07, 08, 09, 10, 11, 12).
- Programming Language Design and Implementation (PLDI); Open64 Workshop'12.
- Programming Language Design and Implementation (PLDI); Multicore and GPU Programming Models, Languages and Compilers Workshop (PLC'12).
- ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP 2010).
- Workshop on Multithreaded Architectures and Applications (MTAAP 07, 08, 09, 10, 11, 12).
- IFIP and ACM SIGARCH International Conference on Parallel Architectures and Compilation Techniques (PACT'94, 95, 96, 97, 98, 99, 00, 01, 07, 10, 11, 12).
- IFIP Working Conference on Distributed and Parallel Embedded Systems (DIPES'06, 07, 08, 09, 10, 11).
- Workshop on Programmability Issues for Multi-Core Computers (MULTIPROG'08, 09, 10, 11, 12)
- International Conference on High-Performance Embedded Architecture and Compilation (HiPEAC 2009).
- ACM Computing Frontiers (CF 2008).

- Asia-Pacific Computer Systems Architecture Conference (ACSAC'06, 07, 08).
- International Conference on Parallel Processing (ICPP'07).
- ACM/IEEE International Conference for High Performance Computing and Communications (SC07, 08, 09, 10, 11).
- ACM/IEEE International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS 2007).
- ACM International Conference on Supercomputing (ICS'95, 02, 03, 04, 06, 07, 08).
- IEEE International Parallel and Distributed Processing Symposium (IPDPS'01, 02, 03, 06, 10).
- Fifth IEEE International Workshop on High Performance Computational Biology (HiCOMB'06).
- ACM International Symposium on Parallel Architectures, Algorithms, and Networks (I-SPAN 2005).
- ACM/IEEE International Symposium on Micro architectures (MICRO'95, 96, 97, 02).
- High Performance Computing Symposium (HPCS'95, 96, 98, 99, 01, 02).
- International Conference on Parallel Processing (EURO-PAR'95, 96, 01).
- Compilers, Architectures and Synthesis for Embedded Systems (CASES'00, 01).
- IEEE International Symposium on High Performance Computer (HPCA'97, 99, 00).
- International Conference on Compiler Construction (CC'98, 99, 00), Europe.
- Working Conference on Massively Parallel Programming Models (MPPM'93, 95, 97, 99).
- International Symposium on High Performance Computing (ISHPC'99), Japan.
- ACM Symposium on Programming Language Design and Implementation (PLDI'98).
- International Parallel Processing Symposium (IPPS'95).
- IEEE International Conference on Algorithms and Architectures for Parallel Processing (ICAPP'95).
- Parallel Architecture and Language Europe (PARLE'91, 92, 93, 94, 95).

### ***PANEL OF INTERNATIONAL CONFERENCES AND MEETINGS***

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Invited as a panel chair or a panelist in panels of many international conferences and meetings.

### ***INVITED SEMINARS AND DISTINGUISHED SEMINARS (Partial)***

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Given seminars in many industrial and academic organizations:

- IBMT.J. Watson Research Center
- IBM Toronto Lab,
- AT&T Bell Laboratories
- BNR
- HP Labs
- Intel
- SGI
- DEC
- Qualcomm
- NRL (Navy Research Lab.)
- JPL (Jet Propulsion Laboratory)
- Sandia National Laboratory
- Oak Ridge National Laboratory
- NASA Ames Research Center
- PNNL (Pacific Northwest National Laboratory)

- MIT
- Stanford University
- UC Berkeley
- NYU
- Cornell University
- University of Maryland
- University of Alberta
- University of Colorado
- University of Southern California
- University of Toronto
- University of Victoria
- University of Michigan

### ***GRANTS AND OTHER REVIEW FUNCTIONS***

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- Invited as National Science Foundation (NSF) grant review panels (many times)
- Invited as an external reviewer of a grant reviewer to NSF-equivalent organizations in other countries (Canada, England, Holland, France, etc.)
- Invited as a reviewer for tenure and other promotion reviewers for professors/scientists both in US and beyond.
- Invited as external Ph.D thesis examiners both within US and internationally (e.g. INRIA (France), Chalmers University (Sweden), Tsinghua University (China), Chinese University of Science and Technology (China), Huazhong University of Science and Technology (China), etc.).

## **Section A: Teaching and Research Supervision**

### ***A.1: TEACHING***

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A series of new courses have been introduced and taught over years. The topics include:

1. Computer Architectures
2. Parallel Computing
3. Parallel and Functional Programming
4. Optimizing and Parallelizing Compilers
5. Discovery Informatics and High-Performance Computing

For a detailed course listing, please see <http://www.capsl.udel.edu/>

### ***A.2: RESEARCH SUPERVISION***

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***Current, graduate students under my supervision include:***

1. Brian Lucas (High Performance IO) (2007 – 2014 Master Expected).
2. Kelly Livingston (Computer Architecture and Parallel Application) (2007 – 2014 Expected)
3. Joshua Suetterlein (TBD) (2010 – 2015 Expected).
4. Aaron M. Landwehr (TBD) (2010 – 2015 Expected).
5. Robert Pavel (Parallel Simulation) (2010 – 2015 Expected).
6. Yao Wu (Big Data) (2011 – 2015 Expected).

7. Jaime Arteaga (TBD) (2013-2017 Expected).
8. Sergio Pino (TBD) (2013-2017 Expected).
9. Jose Monsalve (2014 – 2019 Expected)
10. Pouya Fotouji (2014 – 2019 Expected)
11. Siddhisanket Raskar (2014 – 2019 Expected)
12. Sunil Shrestha (2008 – 2016 Expected)

***Current Postdoc fellows under my supervision include:***

1. Stéphane Zuckerman (2010 – present).
2. Long Zhen (2012– present).
3. Haitao Wei (2012– present).
4. Hao Tu (2013 – present)

***Already Completed:***

The following Graduate students and Post-Docs have already completed their proposed research under my supervision:

**PhD Level:**

1. Elkin Garcia  
*Toward High Performance and Energy Efficiency on Manycore Architectures*  
Summer 2014
2. Juergen Ributzka  
*Concurrency and Synchronization in the Modern Many-Core Era: Challenges and Opportunities*  
University of Delaware (USA), 2009 – 2013.
3. Daniel Orozco  
*TIDeFlow: A Dataflow-inspired execution model for high performance computing programs*  
University of Delaware (USA), 2007 – 2012.
4. Joseph B. Manzano  
*A comparison between virtual code management techniques*  
University of Delaware (USA), 2003 – 2011.
5. Ge Gan  
*Programming model and execution model for OpenMP on the Cyclops-64 manycore processor*  
University of Delaware (USA), 2004 – 2010.
6. Long Chen  
*Exploring novel many-core architectures for scientific computing*  
University of Delaware (USA), 2005 – 2010.
7. Fei Chen  
*Enabling system validation for the many-core supercomputer*  
University of Delaware (USA), 2001 – 2009.
8. Juan del Cuvillo  
*Breaking away from the OS shadow: A program execution model aware thread virtual machine for multicore architectures*  
University of Delaware (USA), 2001 – 2008.



9. Yuan Zhang  
*Static analyses and optimizations for parallel programs with synchronization*  
University of Delaware (USA), 2002 – 2008.
10. Mihailo Kaplarevic  
*Environmental genome informational utility system (EnGENIUS)*  
University of Delaware (USA), 2001 – 2007.
11. Weirong Zhu  
*Efficient synchronization for a large-scale multi-core chip architecture*  
University of Delaware (USA), 2002 – 2007.
12. Rishi Lee Khan  
*Engineering systems neuroscience: Modeling of a key adaptive brain control system involved in hypertension*  
University of Delaware (USA), 2000 – 2007.
13. Alban Douillet  
*A compiler framework for loop nest software-pipelining*  
University of Delaware (USA), 2001 – 2006.
14. Yanwei Niu  
*Parallelization and performance optimization of bioinformatics and biomedical applications targeted to advanced computer architectures*  
University of Delaware (USA), 2001 – 2005.
15. Robel Y. Khsay  
*Advanced protein sequence analysis methods for structure and function prediction*  
University of Delaware (USA), 2001 – 2005.
16. Andres Marquez  
*The CARE architecture*  
University of Delaware (USA), 1995 – 2004.
17. Hongbo Yang  
*Power-aware compilation techniques for high performance processors*  
University of Delaware (USA), 1999 – 2003.
18. Parimala Thulasiraman  
*Irregular computations on fine-grain multithreaded architecture*  
University of Delaware (USA), 1995-2000.
19. Xinan Tang  
*Compiling for multithreaded architectures*  
University of Delaware (USA), 1995 – 1999.
20. Kevin Bryan Theobald  
*EARTH: An Efficient Architecture for Running Threads*  
McGill University (Canada), 1990 – 1999.
21. Erik Richter Altman  
*Optimal software pipelining with function unit and register constraints*  
McGill University (Canada), 1991 – 1996.



22. Shashank Nemawarkar  
*Performance modeling and analysis of multithreaded architectures*  
McGill University (Canada), 1989 – 1996.
23. Vugranam C. Sreedhar  
*Efficient program analysis using DJ graphs*  
McGill University (Canada), 1990 – 1995.
24. Guy Tremblay  
*Parallel implementation of lazy functional languages using abstract demand propagation*  
McGill University (Canada), 1988 – 1994.
25. Qi Ning  
*Register allocation for optimal loop scheduling*  
McGill University (Canada), 1990 – 1993.
26. Herbert H. J. Hum  
*The Super-Actor Machine: A hybrid dataflow/von Neumann architecture*  
McGill University (Canada), 1990 – 1992.
27. Robert Kim Yates  
*Semantics of timed dataflow networks*  
McGill University (Canada), 1988 – 1992.

**MS Level:**

1. Joshua Suetterlein  
*DARTS: A Runtime Based on the Codelet Execution Model*  
Spring 2014
2. Yao Wu  
*Memory Optimization in Codelet Execution Model on Many-Core Architectures*  
Spring 2014
3. Thomas St. John  
*Massively Parallel Breadth First Search Using a Tree-Structured Memory Model*  
University of Delaware (USA), 2007 – 2013.
4. Joshua Landwehr  
*Tapestry: Weaving Execution and Synchronization Models*  
University of Delaware (USA), 2009 – 2013.
5. Sunil Shrestha  
*Parallel Low-Overhead Data Collection Framework for a Resource Centric Performance Analysis Tool*  
University of Delaware (USA), 2007 – 2012.
6. Xiaomi An  
*Memory State Flow Analysis and Its Application*  
University of Delaware (USA), 2009 – 2011.
7. Juergen Ributzka  
*Toward a software pipelining framework for many-core chips*  
University of Delaware (USA), 2005 – 2009.

8. Jonathan L. Barton  
*Hardware implementation of a synchronization state buffer in VHDL*  
University of Delaware (USA), 2005 – 2008.
9. Mark Pellegrini  
*A case study of the Mstack cross-platform benchmark on the Cray MTA-2*  
University of Delaware (USA), 2004 – 2008.
10. Matthew Wells  
University of Delaware (USA), 2006 - 2008.
11. Yi Jiang  
*Design and implementation of tool-chain framework to support OpenMP single source compilation on cell platform*  
University of Delaware (USA), 2006 – 2008.
12. Long Chen  
*Optimizing the Fast Fourier Transform on a many-core architecture*  
University of Delaware (USA), 2005 – 2008.
13. Liping Xue  
*Efficient mapping of fast Fourier transform on the Cyclops-64 multithreaded architecture*  
University of Delaware (USA), 2005 – 2007.
14. Ge Gan  
*CDP: A multithreaded implementation of a network communication protocol on the Cyclops-64 multithreaded architecture*  
University of Delaware (USA), 2004 – 2007.
15. Eun Jung Park  
*Methodology of dynamic compiler option selection based on static program analysis: Implementation and evaluation*  
University of Delaware (USA), 2004 – 2007.
16. Dimitrij Krepis  
*A study of simulation and verification of a many-core architecture on two modern reconfigurable platforms*  
University of Delaware (USA), 2004 – 2007.
17. Divya Parthasarathi  
*Tower methodology for verification of multi-core architecture: A case study*  
University of Delaware (USA), 2003 – 2005.
18. Ying Ping Zhang  
*A study of architecture and performance of IBM Cyclops64 interconnection network*  
University of Delaware (USA), 2003 – 2005.
19. Vishal Karna  
*Multiprocessor SOC Verification*  
University of Delaware (USA), 2002 – 2005.
20. Robert Klosiewics  
*A Parallel Debugger for the Cyclops Architecture*  
University of Delaware (USA), 2002 – 2004.

21. Inanc Dogru  
*An integer linear programming approach to reduce register spills on itanium processors*  
University of Delaware (USA), 2002 – 2004.
22. Xing Wang  
*Quantitive Study of Human-Computer interaction in adaptive search on Mobile Handsets and its Localization for Mandarin Chinese*  
University of Delaware (USA), 2001 – 2004.
23. Weirong Zhu  
*Multithreaded Parallel Implementation of HPMPFAM on EARTH*  
University of Delaware (USA), 2001 – 2004.
24. Fei Chen  
*Implementing Parallel CG Algorithm on the EARTH Multithreaded Architecture*  
University of Delaware (USA), 2001 – 2004.
25. Yan Xie  
*Code Size Oriented Memory Allocation for Temporary Variables*  
University of Delaware (USA), 2001 – 2003.
26. Chuan Shen  
*A Portable Runtime System and its Derivation for the Hardware SU Implementation*  
University of Delaware (USA), 2001 – 2003.
27. Kapil Khosla  
*Binary Diffing*  
University of Delaware (USA), 2001 – 2003.
28. Tamal Basu  
*Survivability of routing protocols in large scale clustered fractal networks*  
University of Delaware (USA), 2001.
29. Rishi Kumar  
*Efficient Parallelization of Reductions and Loop Based Programs on EARTH*  
University of Delaware (USA), 1999 – 2001.
30. Praveen Thiagarajan  
*A Visual Perspective to Motif/Pattern Analysis*  
University of Delaware (USA), 1999 – 2001.
31. Juan. Del. Cuvillo  
*Whole Genome Comparison Using A Multithreaded Parallel Implementation*  
University of Delaware (USA), 1999 – 2001.
32. Christopher J. Morrone  
*A EARTH Runtime System For Multi-Processor/Multi-Node Beowulf Cluster*  
University of Delaware (USA), 1999 – 2001.
33. Alban Douillet  
*Register Stack and Optimal Allocation Instruction Placement*  
University of Delaware (USA), 1999 – 2001.
34. Sean Ryan

*Developing a software distributed shared memory for the EARTH platform*  
University of Delaware (USA), 1999 – 2000.

35. Kamala Prasad Kakulavarapu  
*Dynamic load balancing issues in the EARTH runtime system*  
McGill University (Canada), 1996 – 2000.
36. Ian Stuart MacKenzie Walker  
*Towards a Custom EARTH Synchronization Unit*  
University of Delaware (USA), 1998 – 1999.
37. Cheng Li  
*Earth-SMP: multithreading support on an SMP cluster*  
University of Delaware (USA), 1997 – 1999.
38. Lei Liu  
*The effect of resource complexity on modulo scheduling*  
University of Delaware (USA), 1997 – 1999.
39. Maria-Dana Tarlescu  
*The elastic history buffer: A multi-hybrid branch prediction scheme using static classification*  
McGill University (Canada), 1996 – 1999.
40. Dionis Hristov  
*Development of tests for the ATM signaling protocol*  
McGill University (Canada), 1998.
41. Hisham Johnathon Petry  
*Comparison of SC derived memory models and location consistency on shared memory architectures*  
McGill University (Canada), 1995 – 1997.
42. Haiying Cai  
*Dynamic load balancing on the EARTH-SP system*  
McGill University (Canada), 1997.
43. Raul Esteban Silvera-Munoz  
*Static instruction scheduling for dynamic issue processors*  
McGill University (Canada), 1996 – 1997.
44. Shaohua Han  
*Implementation of nested relations in a database programming language*  
McGill University (Canada), 1996 – 1997.
45. Hongru Cai  
McGill University (Canada), 1995 – 1997.
46. Artour V Stoutchinin  
*Optimal software pipelining: Integer linear programming approach*  
McGill University (Canada), 1994 – 1996.
47. Shamir Fatehali Merali  
*Designing and implementing memory consistency models for shared-memory multiprocessors*  
McGill University (Canada), 1993 – 1996.

48. Alberto Jimenez  
McGill University (Canada), 1993 – 1996.
49. Nasser Elmasri  
*TCL: Experiences on a multiprocessor with dual-processor nodes*  
McGill University (Canada), 1992 – 1995.
50. Renhua Wen  
*The design and implementation of an accurate array data-flow analyzer in the HPC compiler*  
McGill University (Canada), 1993 – 1995.
51. Luis Alfonso Lozano  
*Exploiting short-lived variables in superscalar processors*  
McGill University (Canada), 1992 – 1994.
52. Chandrika Mukerji  
*Register allocation using cyclic interval graphs*  
McGill University (Canada), 1991 – 1994.
53. M Ravi Shanker  
*A parallel implementation of the A\*-Viterbi algorithm for speech recognition*  
McGill University (Canada), 1991 – 1993.
54. Cecile Moura (1991 - 1993)  
*SuperDLX - A Generic Superscalar Simulator*  
McGill University (Canada), 1991 – 1993.
55. Qi Ning  
*Register allocation for optimal loop scheduling*  
McGill University (Canada), 1991 – 1993.
56. Russell Olsen  
*Collective Loop Fusion for Array Contraction*  
McGill University (Canada), 1989 – 1992.
57. Nematollaah Shiri-Varnaamkhaasti  
*A design and implementation of unimodular transformations of loops*  
McGill University (Canada), 1990 – 1992.
58. Yue-Bong Wong  
*A petri-net model for loop scheduling*  
McGill University (Canada), 1989 – 1991.
59. Jean-Marc Monti  
*Interprocessor communication supports for a multiprocessor dataflow machine*  
McGill University (Canada), 1989 – 1991.
60. Alan Emtage  
McGill University (Canada), 1988 – 1991.
61. Zaharias Paraskevas  
*Code generation for dataflow software pipelining*  
McGill University (Canada), 1987 – 1989.

**Postdoc:**

1. Chen Chen (2011– 2013).
2. Souad Koliai (2012– 2013).
3. Xiaoxuan Meng (2009 – 2011).
4. Handong Ye (2008 – 2009).
5. Yeonseok Lee (2007 – 2008).
6. Jean Christophe Beyler (2007 – 2008).
7. Ziang Hu (1999 – 2008).
8. Haiping Wu (2000 – 2008).
9. Ioannis E. Venetis (2006 – 2007).
10. Shuxin Yang (2005 – 2007).
11. Ted T. Jeong (2005 – 2006).
12. Hongbo Rong (2001 – 2005).
13. Hirofumi sakane (2001 – 2005).
14. Andres Marquez (2004).
15. Jozsef bukszar (2002 – 2004).
16. Jizhu Lu (2000 – 2004).
17. Jianshan Tang (2002 – 2003).
18. Rongcai Zhao (2000 – 2001).
19. José N. Amaral (1998 – 2000).
20. Ruppa Thulasiraman (1998 – 2000).
21. Gerd Heber (1997 – 1999).
22. Chihong Zhang (1998 – 1999).
23. Olivier Maquelin (1994 – 1998).
24. Jian Wang (1995 – 1997).
25. Xinmin Tian (1993 – 1996).
26. Benoit Dupont Dinechi (1995 – 1996).
27. Ramaswamy Govindarajan (1990 – 1994).
28. Guoning Liao (1991 – 1993).

Those who have graduated are trained in the field of parallel architectures and compilers, as evidenced by the fact that they have been working (or worked) as tenure-track university professors (Ramaswamy Govindarajan, Guy Tremblay, José N Amaral, Parimala Thulasiraman, Ruppa Thulasiraman) as engineers in key industrial sectors, e.g., Intel (Herbert H. J. Hum, Xinmin Tian, Prasad Kakulavarapu, Shaohua Han, Kevin B. Theobald, Ian Walker, Sean Ryan, Divya Parthasarathi, Yingping Zhang), Nortel (Jian Wang), IBM (Erik R. Altman, Shashank Nemawarkar, Vugranam C. Sreedhar, Rauls Silvera), Microsoft (Hongbo Rong, Weirong Zhu, Yuan Zhang), BNR (Guoning Liao, Renhua Wen), HP (Luis A. Lozano, Alban Douillet, Shuxin Yang), Convex (Qi Ning), NCUBE (Russell Olsen), CAE (Nasser Elmasri), AT&T (Hisham J. Petry), Qualcomm (Vishal Karnal, Rishi Kumar, Chihong Zhang) and as researchers in government labs, e.g., LLNL (Robert K. Yates, Christopher J. Morrone), PNNL (Andrés Marquez), or assuming other professional jobs.

**Section B: Scholarship*****B.1: RESEARCH ACTIVITY AND INTERESTS***

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**1. Computer Architecture and Parallel Systems**

There are a number of topics Gao has made important contributions that have great impact in the field. To name a few: (1) multithreaded architecture models and features leading/ pioneered the conception and design of a unique fine-grain multithreaded architecture based on static dataflow models - the well-known EARTH (Efficient Architecture for Running THreads) model; EARTH has applied the principles of dataflow computation principles to parallel computer architectures built from commodity components while demonstrating a migration path from commodity to custom hardware technology for scalable

performance – the lasting impact of which will be appreciated even more when the emerging technology revolution of multi-core chips will need to deal with similar issues on fine-grain parallelism that EARTH has addressed in the past; (2) a novel memory consistency model (i.e. the Location Consistency) -- a new memory model for shared memory machines that allows the implementation of an efficient cache coherence protocol which avoids invalidation traffic and requires neither bus snooping, nor directories; (3) novel architecture features exploring instruction-level parallelism (e.g. superscalar architecture support of short-lived variables, the fundamental notion of instruction-level parallelism smoothability and others.

## 2. Optimizing and Parallelizing Compilers

There are a number of topics Gao has made important contributions that have great impact in this field. To name a few: program analysis techniques (e.g. fast algorithms to compute and apply SSA form, loop nests optimization (e.g. collective loop fusion and optimization) and instruction scheduling and register allocation (e.g. register allocation based on interval graphs), and software pipelining. Software pipelining is one of the most important compiler technologies for the exploitation of instruction-level parallelism in code optimization for modern microprocessor architectures. Gao's contribution to software pipelining area is very impressive. Gao's work is unique as he has proposed to view the software pipelining problem from the angle of a dataflow program graph model that has led interesting and distinct paths to formulate and solve some of the hard problems facing software pipelining. For example, his work on inner-most loop software pipelining pioneered a novel integer linear programming based methodology to solve the scheduling and register allocation problems in software pipelining, and his most recent work by extending software pipelining for nested loops [see his ACM PLDI2005 paper (<ftp://ftp.capsl.udel.edu/pub/doc/papers/SSP-RegAlloc.pdf>) and IEEE/ACM CGO 2004 papers (<ftp://ftp.capsl.udel.edu/pub/doc/papers/SSP-Scheduling.pdf>, <ftp://ftp.capsl.udel.edu/pub/doc/papers/SSP-CodeGen.pdf>) have opened a new path to exploit parallelism for nested loops.

## 3. Runtime systems

In recent years, the elements required to design a successful computer system have been unified with the introduction of the execution model theory. G.R. Gao has devoted a significant part of his career to lead cutting edge research on the field of execution models. Gao has shown that Runtime Systems are essential to support execution models by enforcing and supporting the semantics of programs. Gao's work has resulted in prominent contributions to the field, including the development of runtime systems to support the execution of programs as required by DARPA's Ubiquitous High Performance Computing (UHPC) project. In the UHPC project, Gao has been in charge of designing the system software, the runtime system and the execution models. Gao's work on runtime systems has resulted in numerous scientific papers and several awards. For example, his work on execution models has led new models such as The Time Iterated Dependency Flow Execution Model (TIDeFlow), designed for efficient development of high performance parallel programs for many-core architectures [<http://www.capsl.udel.edu/pub/doc/papers/DFM2011-Orozco.pdf>]. Gao has also received the 2011 Gauss Award, an international award recognizing the most outstanding research paper in the field of scalable supercomputing [<http://www.udel.edu/udaily/2012/aug/gao-gauss-award-080411.html>]. Gao's work on dynamic scheduling and energy aware optimizations has been extensively published and awarded at international conferences [See IPDPS-MTAAP <http://www.capsl.udel.edu/pub/doc/papers/garcia-mtaap2012.pdf> and the best paper award at Hipeac-MULTIPROG <http://www.capsl.udel.edu/pub/doc/papers/MULTIPROG2010-Garcia.pdf>]

## 4. Applications: Bio-Informatics and High Performance Computing



Our long-term research goal is to apply high-performance computing technology to remove road blocks in solving critical problems in bioinformatics. We recognize that a main challenge is providing biologists with a smooth interactive solution platform for knowledge discovery from large data sets which, unfortunately, are grossly incomplete and have a considerable amount of errors. CAPB consists of researchers with strong computer engineering and computer science backgrounds who are eager to collaborate with researchers from other fields, and are dedicated to finding innovative solutions to meet the above challenges.

## ***B.2: LIST OF RESEARCH PUBLICATIONS***

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The contributions are listed under the following category:

**Referred Journal Publications**  
**Referred Conference Publications**  
**Books/ Book Chapters/ Notes Sets**  
**Patents**

### **A. Referred Journal Publications**

1. Roberto Giorgi, Rosa M. Badia, François Bodin, Albert Cohen, Paraskevas Evripidou, Paolo Faraboschi, Bernhard Fechner, Guang R. Gao, Arne Garbade, Rahul Gayatri, Sylvain Girbal, Daniel Goodman, Behran Khan, Souad Koliaï, Joshua Landwehr, Nhat Minh LêFeng Li, Mikel Lujà Avi Mendelson, Laurent Morin, Nacho Navarro, Tomasz Patejko, Antoniu Pop, Pedro Trancoso, Theo Ungerer, Ian Watson, Sebastian Weis, Stéane Zuckerman, Mateo Valero, ***TERAFLUX: Harnessing dataflow in next generation teradevices***, Microprocessors and Microsystems - Journal, Available online 18 April 2014, ISSN 0141-9331.
2. Chen Chen, Souad Koliai and Guang R. Gao. ***Exploitation of Locality for Energy Efficiency for Breadth First Search in Fine-grain Execution Models***. Tsinghua Science and Technology - Journal, Volume 18, Number 3, June 2013.
3. Haitao Wei, Mingkang Qin, Junqing Yu, Dongrui Fan and Guang R. Gao. ***StreamTMC: Stream Compilation for Tiled Multi-core Architectures***. Elsevier Journal of Parallel and Distributed Computing (JPDC), Volume 73, Issue 4, April 2013, Pages 484–494.
4. Haitao Wei, Junqing Yu, Huafei Yu, Mingkang Qin, Guang R. Gao. ***Software Pipelining for Stream Programs on Resource Constrained Multicore Architectures***. IEEE Transactions on Parallel and Distributed Systems, Volume 23(12), 2338-2350, Dec. 2012.
5. Daniel Orozco, Elkin Garcia, Rishi Khan, Kelly Livingston and Guang R. Gao. ***Toward High Throughput Algorithms on Many Core Architectures***. ACM Transactions on Architecture and Code Optimization (TACO), Volume 8, Issue 4, January 2012, Article No. 49.
6. Jack B. Dennis, Guang R. Gao, Xiao X. Meng. ***Experiments with the Fresh Breeze tree-based memory model***, Computer Science - Research and Development, Volume 26 Issue 3-4, pp. 325-337, June 2011.
7. Guangming Tan, Vugranam C. Sreedhar and Guang R. Gao. ***Analysis and Performance Results of Computing Betweenness Centrality on IBM Cyclops64***, Journal of Supercomputing. Vol. 56 Issue 1, April 2011.
8. Guangming Tan, Ninghui Sun and Guang R. Gao. ***Improving Performance of Dynamic Programming via Parallelism and Locality on Multi-core Architectures***, IEEE Transactions on Parallel and Distributed Systems, Vol.20, No.2, 2009, pp. 261-274.
9. Hongbo Rong, Alban Douillet, Guang R. Gao. ***Register allocation for software pipelined multidimensional loops***. *ACM Trans. Program. Lang. Syst.* 30(4), July 2008.
10. M. Kaplarevic, A.E. Murray, G. Gao, ***EnGENIUS - Environmental Genome Informational Utility System***, Journal of Bioinformatics and Computational Biology, JBCB-119R1, July, 2008.
11. Rishi L. Khan, Rajanikanth Vadigepalli, Mary K. McDonald, Robert F. Rogers, Guang R. Gao and James S. Schwaber, ***Dynamic transcriptomic response to acute hypertension in the nucleus tractus solitaries***, AJP - Regulatory, Integrative and Comparative Physiology. Volume 295: R15-R27, July, 2008.

12. Hongbo Rong, Zhizhong Tang, R. Govindarajan, and Alban Douillet, Guang R. Gao, ***Single-dimension software pipelining for multi-dimensional loops***. ACM Transactions on Architecture and Code Optimization, Vol.4, No.1, January, 2007.
13. Weirong Zhu, Yanwei Niu, and Guang R. Gao, ***Performance Portability on EARTH: A Case Study across Several Parallel Architectures***, Cluster Computing, Volume 10, Number 2, Page 115-126, 2007.
14. Rishi L Khan, Gregory E Gonye, Guang Gao and James S Schwaber, ***A universal reference sample derived from clone vector for improved detection of differential gene expression***, BMC Genomics, Volume 7:109, May, 2006.
15. Haiping Wu, Ziang Hu, Joseph Manzano and Guang. R. Gao, ***Madd Operation Aware Redundancy Elimination***, International Journal of Software Engineering and Knowledge Engineering, Vol. 15, No. 2, Pages: 357-362, 2005
16. Hongbo Yang, R. Govindarajan, Guang R. Gao, ZiangHu, ***Improving Power Efficiency with Compiler-Assisted Cache Replacement***, Journal of Embedded Computing, Vol. 1, No. 4, Pages: 487-499, 2005.
17. Robel Khasay, Li Liao , Guang Gao, ***An Improved Hidden Markov Model for Transmembrane Protein Topology Prediction and Its Applications to Complete Genomes***, Bioinformatics, Volume 21, Number 9, Pages: 1853-158, 2005.
18. Robel Khasay, Guoli Wang, Guang Gao, Li Liao and Roland Dunbrack, ***Quasi-Consensus Based COMParison of Profile Hidden Markov Models for Protein Sequences***, Bioinformatics, Volume 21, Number 10, Pages: 2287-2293, 2005
19. Weirong Zhu, Yanwei Niu, Jizhu Lu, Chuan Shen and Guang R. Gao, ***A Cluster-Based Solution for High Performance Hmmpfam Using EARTH Execution Model***, International Journal of High Performance Computing and Networking, Vol 2, Issue 2/3/4, 2004.
20. Parimala Thulasiraman, Kevin B. Theobald, Ashfaq A. Khokhar, and Guang R. Gao, ***Efficient Multithreaded Algorithms for the Fast Fourier Transform***, Parallel and Distributed Computing Practices, Vol. 5, No. 2, Pages: 177-191, 2004.
21. Parimala Thulasiraman, Ashfaq A. Khokhar, Gerd Heber, Guang R. Gao, ***A Fine-Grain Load Adaptive Algorithm of the 2D Discrete Wavelet Transform for Multithreaded Architectures***, Journal of Parallel and Distributed Computing (JPDC), Vol.64, No.1, Pages: 68-78, January 2004.
22. Dong Rui Fan, Hongbo Yang, Gaung R. Gao, and Rong Cai Zhao, ***Evaluation and Choice of Various Branch Predictors for Low-Power Embedded Processor***, Journal of Computer Science and Technology, Vol. 18, No. 6, Pages: 833-838, November, 2003.
23. Guy Tremblay, Christopher J. Morrone, José N. Amaral, and Guang R.Gao, ***Implementation of the EARTH Programming Model on SMP Clusters: a Multi-Threaded Language and Runtime System***, Concurrency and Computation: Practice and Experience, Vol. 15, No. 9, Pages: 821-844, August 2003.
24. Ramaswamy Govindarajan, Hongbo Yang, José N Amaral, Chihong Zhang, and Guang R. Gao, ***Minimum Register Instruction Sequencing to Reduce Register Spills in Out-of-Order Issue Superscalar Architectures***, in IEEE Transactions on Computers, Vol. 52, No. 1, Pages: 4-20, January 2003.
25. Rishi Khan, Yujing Zeng, Javier Garcia-Frias, Guang Gao, ***A Bayesian Modeling Framework for Genetic Regulation***, Proceeding of the IEEE Computer Society Bioinformatics Conference (CSB'02), Pages: 330-333, Los Alamitos, CA, August 14-16, 2002.
26. Ramaswamy Govindarajan and Guang R. Gao, ***Minimizing Buffer Requirements in Rate-Optimal Schedules in Regular Dataflow Networks***, Journal of VLSI Signal Processing, Vol. 31, No. 3, Pages: 207-229, Jul 2002.
27. Adalberto T. Castelo, Wellington S. Martins, and Guang R. Gao, ***TROLL--Tandem Repeat Occurrence Locator***, Bioinformatics, Vol. 18, No. 4, Pages: 634-636, April 2002.
28. Ramaswamy Govindarajan, Erik R. Altman, and Guang R. Gao, ***A Theory for Co-Scheduling Hardware and Software Pipelines in ASIPs and Embedded Processors***, Design Automation for Embedded Systems, Vol. 6, No. 3, Pages: 243-275, March 2002.
29. Robel Y. Khasay, Nataraj Dongre, Guang R. Gao, Guoli Wang, and Roland L. Dunbrack Jr., ***CASA: A Server for The Critical Assessment of Sequence Alignment Accuracy***, Bioinformatics, Vol. 18, No. 3, Pages: 496-497, March 2002.

30. Francisco J. Useche, Guang R. Gao, Mike Hanafey and Antoni Rafalski, ***High-Throughput Identification, Database Storage and Analysis of SNPs in EST Sequences***, Genome Informatics 12, Pages: 194-203, December 2001.
31. José N Amaral, Wen-Yen Lin, Jean-Luc Gaudiot, and Guang R. Gao, ***Exploiting Locality in single Assignment Data Structures Updated through Split Phase Transactions***, Cluster Computing, Special issue on Internet Scalability: Advances in Parallel, Distributed and Mobile Systems, Vol. 4, No. 4, Pages: 281-293, October 2001.
32. Prasad Kakulavarapu, Olivier Maquelin, José N Amaral, and Guang R. Gao, ***Dynamic Load Balancers for a Multithreaded Multiprocessor System***, Parallel Processing Letters, Vol. 11, No. 1, Pages: 169-184, March 2001.
33. Guang R. Gao and Vivek Sarkar, ***Location Consistency-- A New Memory Model and Cache Consistency Protocol***, IEEE Transactions on Computers, Vol. 49, No. 8, Pages: 798-813, August 2000.
34. Gerd Heber, Rupak Biswas, Guang R. Gao, ***Self-avoiding walks over adaptive unstructured grids***, Concurrency: Practice and Experience, Vol. 12, Iss. 2-3, Pages: 85 - 109, Jun. 2000.
35. Xinan Tang and Guang R. Gao, ***Automatically Partitioning Threads for Multithreaded Architectures, Special Issues on Compilation and Architectural Support for Parallel Applications***, Journal of Parallel and Distributed Computing, Vol. 58, No. 2, Pages: 159-189, August 1999.
36. Walid A. Najjar , Edward A Lee, and Guang R Gao, ***Advances in the Dataflow Computational Model, Parallel Computing*** , Vol. 25, No.13 - 14, Pages: 1907 - 1927, 1999.
37. Erik R. Altman and Guang R. Gao, ***Optimal Modulo Scheduling Through Enumeration***, International Journal on Parallel Programming, Vol. 26, No.2, Pages: 313-344, 1998.
38. Erik R. Altman, Ramaswamy Govindarajan, and Guang R. Gao, ***A Unified Framework for Instruction Scheduling and Mapping for Function Units with Structural Hazards***, Journal of Parallel and Distributed Computing, Vol. 49, No. 2, Pages: 259-293, 1998.
39. Vugranam C. Sreedhar, Guang R. Gao, and Yong-Fong Lee, ***A New Framework for Elimination Based Data Flow Analysis Using DJ Graphs***, ACM Transaction on Programming Languages and Systems, Vol. 20, No. 2, Pages 388-435, March 1998.
40. Vugranam C. Sreedhar, Guang R. Gao, and Yong-fong Lee, ***Incremental Computation of Dominator Trees***, ACM Transactions on Programming Languages and Systems, Vol. 19, No. 2, Pages: 239-252, March 1997.
41. Vugranam C. Sreedhar, Guang R. Gao, and Yongfong Lee, ***A Quadratic Time Algorithm for Computing Multiple Node Immediate Dominators***, Journal of Programming Languages, 1996.
42. Vugranam C. Sreedhar, Guang R. Gao, and Yongfong Lee, ***Identifying Loops Using DJ Graphs***, ACM Transactions on Programming Languages and Systems, Vol. 18, No. 6, Pages: 649 - 658, November 1996.
43. Ramaswamy Govindarajan, Erik R. Altman, and Guang R. Gao. ***A Framework for Resource-constrained Rate-optimal Software Pipelining***, IEEE Transactions on Parallel and Distributed Systems, Vol. 7, No. 11, Pages: 1133-1149, November 1996.
44. Herbert H. J. Hum, Olivier Maquelin, Kevin B. Theobald, Xinmin Tian, Guang R. Gao, and Laurie J. Hendren, ***A Study of the EARTH-MANNA Multithreaded System***, International Journal of Parallel Programming, Vol. 24, No. 4, Pages: 319-347, August 1996.
45. Eshrat Arjomandi, William O'Farrell, Ivan Kalas, Gita Koblents, Frank Ch. Eigler, and Guang. R. Gao, ***ABC++: Concurrency by Inheritance in C++***, IBM Systems Journal, Vol. 34, No. 1, Pages: 120-137, 1995.
46. Vugranam C. Sreedhar and Guang R. Gao, ***A Linear Time Algorithm for Placing OE-nodes***, Journal of Programming Languages, 1995. Accepted.
47. Vugranam C. Sreedhar and Guang R. Gao, ***Computing phi-nodes in Linear Time Using DJ Graphs***, Journal of Programming Languages, Vol. 3, Pages: 191-213, April 1995.
48. Qi Ning, Vincent V. Dongen, and Guang R. Gao, ***Automatic Data and Computation Decomposition for Distributed Memory Machines***, Parallel Processing Letters, Vol. 5, No. 4, Pages: 539-550, April 1995.
49. Ramaswamy Govindarajan and Guang R. Gao, ***Rate-optimal Schedule for Multi-rate DSP Computations***, Journal of VLSI Signal Processing, Vol. 9, No.3, Pages: 211-232, April 1995.

50. Guoning Liao, Guang R. Gao, Vinod K. Agarwal, ***A dynamically scheduled parallel DSP architecture for stream flow programming***, Journal of Microcomputer Applications, Vol. 17, Iss. 2 Pages: 171 - 196, April 1994
51. Laurie J. Hendren, Guang R. Gao, Erik R. Altman, and Chandrika Mukerji, ***A Register Allocation Framework Based on Hierarchical Cyclic Interval Graphs***, The Journal of Programming Languages, Vol. 1, No. 3, Pages: 155-185, 1993.
52. Guang. R. Gao, ***An Efficient Hybrid Dataflow Architecture Model***, Journal of Parallel and Distributed Computing, Vol. 19, No. 4, Pages: 293-307, December 1993.
53. Qi Ning and Guang R. Gao, ***Optimal Loop Storage Allocation for Argument-fetching Dataflow Machines***, International Journal of Parallel Programming, Vol. 21, No. 6, Pages: 421-448, December 1992.
54. Herbert H. J. Hum, and Guang. R. Gao, ***A High-speed Memory Organization for Hybrid Dataflow/von Neumann Computing***, Future Generation Computer Systems, Vol. 8, Pages: 287-301, 1992.
55. Guang. R. Gao, Herbert H. J. Hum, and Yue-Bong Wong, ***Toward Efficient Fine-grain Software Pipelining and the Limited Balancing Techniques***, International Journal of Mini and Microcomputers, Vol. 13, No. 2, Pages: 57-68, 1991.
56. Guang R. Gao, ***Exploiting Fine-grain Parallelism on Dataflow Architectures***, Parallel Computing, Vol. 13, No. 3, Pages: 309-320, March 1990.
57. Guang R. Gao, ***Algorithmic Aspects of Balancing Techniques for Pipelined Data Flow Code Generation***, Journal of Parallel and Distributed Computing, Vol. 6, No. 1, Pages: 39-61, 1989.
58. Guang R. Gao, ***A stability classification method and its application to pipelined solution of linear recurrences***, Parallel Computing, Vol. 4. No. 3, Pages: 305-321, June 1987.
59. Guang R. Gao, ***A Maximally Pipelined Tridiagonal Linear Equation Solver***, Journal of Parallel and Distributed Computing, Vol. 3, No. 2, Pages: 215-235, 1986.
60. Jack B. Dennis, Guang R. Gao, Kenneth W. Todd, ***Modeling the Weather with a Data Flow Supercomputer***. IEEE Transactions on. Computers Vol. 33, No. 7, Pages: 592-603, July 1984.

## B. Referred Conference Publications

1. Xiaoming Li, Jack Dennis, Guang Gao, Willie Lim, Haitao Wei, Chao Yang and Robert Pavel, ***"FreshBreeze: A Data Flow Approach for Meeting DDDAS Challenges"***, To appear in proceedings of the International Conference On Computational Science (ICCS2015). Reykjavík, Iceland, June 2, 2015
2. A. Marquez, J. Manzano, S. Song, B. Meister, S. Shrestha, T. St. John and G. R. Gao, ***"ACDT: Architected Composite Data Types Trading-in Unfettered Data Access for Improved Execution"*** To appear in The 20th IEEE International Conference on Parallel and Distributed Systems, Hsinchu, Taiwan, December 2014.
3. S. Shrestha, J. Manzano, A. Marquez, J. Feo and G. R. Gao, ***"Jagged Tiling for Intra-tile Parallelism and Fine-Grain Multithreading"*** To appear in the 27th International Workshop on Languages and Compilers for Parallel Computing, Hillsboro, OR, USA, September, 2014.
4. Stéphane Zuckerman, Aaron Landwehr, Kelly Livingston, and Guang Gao, ***"Toward a Self-Aware Codelet Execution Model"*** To appear in proceedings of 4th Workshop Data-Flow Execution Models for Extreme Scale Computing (DFM'14), August 24, 2014, Edmonton, Alberta, Canada.
5. Jack B. Dennis and Guang R. Gao, ***"On the Feasibility of a Codelet Based Multi-core Operating System"*** To appear in the 4th Workshop on Data-Flow Execution Models for Extreme Scale Computing (DFM'14), August 24, 2014, Edmonton, Alberta, Canada.
6. Jaime Arteaga, Stephane Zuckerman, Elkin Garcia, and Guang R. Gao, ***Position Paper: Locality-Driven Scheduling of Tasks for Data-Dependent Multithreading***, To appear in Proceedings of Workshop on Multi-Threaded Architectures and Applications (MTAAP 2014), May 2014.
7. Tom St. John, Benoit Meister, Andres Marquez, Joseph B. Manzano, Guang R. Gao, and Xiaoming Li, ***ASAFESSS: A Scheduler-driven Adaptive Framework for Extreme Scale Software Stacks***, In Proceedings of the 4th International Workshop on Adaptive Self-Tuning Computing Systems



- (ADAPT'14); 9th International Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC'14), Vienna, Austria. January 20-22, 2014. *Best Paper Award*.
8. Elkin Garcia, Daniel Orozco, Rishi Khan, Ioannis Venetis, Kelly Livingston and Guang Gao , ***A Dynamic Schema to increase performance in Many-core Architectures through Percolation operations***, In Proceedings of the 2013 IEEE International Conference on High Performance Computing (HiPC 2013), December 18 - 21, Hyderabad, India, 2013.
  9. Elkin Garcia, Jaime Arteaga, Robert Pavel, and Guang R. Gao, ***Optimizing the LU Factorization for Energy Efficiency on a Many-Core Architecture***, In Proceedings of the 26th International Workshop on Languages and Compilers for Parallel Computing (LCPC 2013), Santa Clara, CA, September 25-27, 2013.
  10. Haitao Wei, Guang R. Gao, Weiwei Zhang, Junqing Yu, ***COSTream: A Dataflow Programming Language and Compiler for Multi-Core Architecture***, In Proceedings of Data-Flow Models (DFM) for extreme scale computing Workshop 2013 in conjunction with Parallel Architectures and Compilation Technologies (PACT 2013), Edinburgh, Scotland, September 8 of 2013.
  11. Marco Solinas, Rosa M. Badia, François Bodin, Albert Cohen, Paraskevas Evripidou, Paolo Faraboschi, Bernhard Fechner, Guang R. Gao, Arne Garbade, Sylvain Girbal, Daniel Goodman, Behran Khan, Souad Koliai, Feng Li, Mikel Luján, Laurent Morin, Avi Mendelson, Nacho Navarro, Antoniu Pop, Pedro Trancoso, Theo Ungerer, Mateo Valero, Sebastian Weis, Ian Watson, Stéphane Zuckermann, Roberto Giorgi, ***The TERAFLUX Project: Exploiting the DataFlow Paradigm in Next Generation Teradevices***, In Proceedings of the 16th Euromicro Conference on Digital System Design, Santander, Spain, September 4-6, 2013.
  12. Joshua Suetterlein, Stephane Zuckerman, Guang R. Gao, ***An Implementation of the Codelet Model***, In Proceedings of 19th International European Conference on Parallel and Distributed Computing (Euro-Par 2013), Aachen, Germany. August 26th, 2013.
  13. Aaron Landwehr, Stephane Zuckerman, and Guang R. Gao, ***Toward a Self-aware System for Exascale Architectures***, In Proceedings of Euro-Par 2013: Parallel Processing Workshops; the 1st Workshop on Runtime and Operating Systems for the Many-core Era (ROME 2013), Aachen, Germany. August 26th, 2013.
  14. Chen Chen, Yao Wu, Joshua Sutterlein, Long Zheng, Minyi Guo, and Guang R. Gao, ***Automatic Locality Exploitation in the Codelet Model***", In Proceedings of 11th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA-13), Melbourne, Australia, July 2013.
  15. Chen Chen, Yao Wu, Stephane Zuckerman, and Guang R. Gao, ***Towards Memory-Load Balanced Fast Fourier Transformations in Fine-grain Execution Models***, In Proceedings of Workshop on Multithreaded Architectures and Applications (MTAAP 2013), May 24, 2013, Boston, Massachusetts USA.
  16. Elkin Garcia and Guang R. Gao, ***Strategies for improving Performance and Energy Efficiency on a Many-core***, In Proceedings of 2013 ACM International Conference on Computer Frontiers (CF 2013), May 14-16, Ischia, Italy, ACM, 2013.
  17. Jack B. Dennis, Guang R. Gao, and Vivek Sarkar, ***Determinacy and Repeatability of Parallel Program Schemata***, In Proceedings of Second Workshop on Data-Flow Execution Models for Extreme Scale Computing (DFM 2012), Minneapolis, MN, USA, September 23, 2012.
  18. Daniel Orozco, Elkin Garcia, Robert Pavel, Orlando Ayala, Lian-Ping Wang and Guang R. Gao. ***Demystifying Performance Predictions of Distributed FFT3D Implementations***, In Proceedings of the 9th IFIP International Conference on Network and Parallel Computing (NPC 2012), Gwangju. Korea. September 6 - 8, 2012.
  19. Sunil Shrestha, Chun-Yi Sun, Amanda White, Joseph Manzano, Andres Marquez, Jhon Feo, Kirk Cameron and Guang R. Gao. ***MODA: A Framework for Memory Centric Performance Characterization***. In Proceedings of the 2nd International Workshop on High-Performance Infrastructure for Scalable Tools (WHIST 2012); 26th International Conference of Supercomputing (ICS'12), Venice, Italy. June 29, 2012.
  20. Elkin Garcia, Daniel Orozco, Robert Pavel and Guang R. Gao. ***A discussion in favor of Dynamic Scheduling for regular applications in Many-core Architectures***, In Proceedings of 2012 Workshop on Multithreaded Architectures and Applications (MTAAP 2012); 26th IEEE

- International Parallel & Distributed Processing Symposium (IPDPS 2012), Shanghai, China. May 25, 2012.
21. Elkin Garcia, Daniel Orozco, Rishi Khan, Ioannis Venetis, Kelly Livingston and Guang Gao, ***Dynamic Percolation: A case of study on the shortcomings of traditional optimization in Many-core Architectures***, in Proceedings of ACM International Conference on Computer Frontiers, May 15 - 17, Cagliari, Italy, ACM, 2012.
  22. Tom St. John, Jack B. Dennis and Guang R. Gao. ***Massively Parallel Breadth First Search Using a Tree-Structured Memory Model***. In Proceedings of International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM 2012); 17th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP'12), New Orleans, LA, USA. February 25-29, 2012.
  23. Daniel Orozco, Elkin Garcia, Rishi Khan, Kelly Livingston and Guang R. Gao. ***Toward High Throughput Algorithms on Many Core Architectures***, In Proceedings of 7th International Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC), Paris, France. January 23-25, 2012.
  24. Daniel Orozco, Elkin Garcia, Robert Pavel, Rishi Khan and Guang R. Gao, ***TIDeFlow: The Time Iterated Dependency Flow Execution Model***, In Proceedings of Workshop on Data-Flow Execution Models for Extreme Scale Computing (DFM 2011); 20th International Conference on Parallel Architectures and Compilation Techniques (PACT 2011), Galveston Island, TX, USA. October 10 - 14, 2011.
  25. Long Chen, Oreste Villa and Guang R. Gao, ***Exploring Fine-Grained Task-based Execution on Multi-GPU Systems***, In Proceedings of Workshop on Parallel Programming on Accelerator Clusters (PPAC 2011); IEEE Cluster 2011. Austin, TX, USA. September 26, 2011.
  26. Lian-Ping Wang, Orlando Ayala, Hossein Parishani, Wojciech W Grabowski, Andrzej A Wyszogrodzki, Zbigniew Piotrowski, Guang R Gao, Chandra Kambhamettu, Xiaoming Li, Louis Rossi, Daniel Orozco and Claudio Torres. ***Towards an integrated multiscale simulation of turbulent clouds on PetaScale computers***, In Proceedings of 13th European Turbulence Conference (ETC13), Warsaw, Poland. September 12-15, 2011.
  27. Daniel Orozco, Elkin Garcia, Robert Pavel, Rishi Khan and Guang R. Gao, ***Polytasks: A Compressed Task Representation for HPC Runtimes***, In Proceedings of the 24th International Workshop on Languages and Compilers for Parallel Computing (LCPC 2011), Fort Collins, CO, USA. September 8-10, 2011.
  28. Joseph B. Manzano, Ge Gan, Juergen Ributzka, Sunil Shrestha and Guang R. Gao ***OPELL and PM: A Case Study on Porting Shared Memory Programming Models to Accelerators Architectures***, In Proceedings of the 24th International Workshop on Languages and Compilers for Parallel Computing (LCPC 2011), Fort Collins, CO, USA. September 8-10, 2011.
  29. Yonghong Yan, Sanjay Chatterjee, Daniel Orozco, Elkin Garcia, Zoran Budimlic, Jun Shirako, Robert Pavel, Guang R. Gao and Vivek Sarkar, ***Hardware and Software Tradeoffs for Task Synchronization on Manycore Architectures***, In Proceedings of International European Conference on Parallel and Distributed Computing (Euro-Par'11), Bordeaux, France. August 29 - September 2, 2011.
  30. Jack B. Dennis, Guang R. Gao and Xiao X. Meng, ***Experiments with the Fresh Breeze Tree-Based Memory Model***, In Proceedings of International Supercomputing Conference (ISC'11), Hamburg, Germany, June 19-23, 2011.
  31. Stephane Zuckerman, Joshua Suetterlein, Rob Knauerhase and Guang R. Gao , Position Paper: ***Using a "Codelet" Program Execution Model for Exascale Machines***, In Proceedings of ACM SIGPLAN 1st International Workshop on Adaptive Self-Tuning Computing Systems for the Exaflop Era (EXADAPT 2011); Programming Language Design and Implementation (PLDI 2011). San Jose, CA, USA. June 5, 2011.
  32. Juergen Ributzka, Joseph B. Manzano, Yuhei Hayashi and Guang R. Gao, ***The Elephant and the Mice: Non-Strict Fine-Grain Synchronization for Many-Core Architectures***, In Proceedings of 25th International Conference on Supercomputing (ICS'11), Tucson, AZ, USA. May 31 - June 4, 2011.
  33. Juergen Ributzka, Yuhei Hayashi, Fei Chen and Guang R. Gao, ***DEEP: An Iterative FPGA-based Many-Core Emulation System for Chip Verification and Architecture Research***, In

- Proceedings of 19th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA'11), Monterrey, CA, USA. February 27 - March 1, 2011.
34. Elkin Garcia, Daniel Orozco and Guang R. Gao, ***Energy efficient tiling on a Many-Core Architecture***, 4th Workshop on Programmability Issues for Heterogeneous Multicores (MULTIPROG-2011); held in conjunction with the 6th International Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC), Heraklion, Greece, January 23, 2011.
  35. Daniel Orozco, Elkin Garcia and Guang R. Gao, ***Locality Optimization of Stencil Applications using Data Dependency Graphs***, The 23rd International Workshop on Languages and Compilers for Parallel Computing (LCPC2010), Rice University, Houston, Texas, USA, October 7-9, 2010.
  36. Elkin Garcia, Ioannis E. Venetis, Rishi Khan and Guang R. Gao, ***Optimized Dense Matrix Multiplication on a Many-Core Architecture***. In Proceedings of International European Conference on Parallel and Distributed Computing (Euro-Par'10), Ischia, Italy, August 31-September 3, 2010.
  37. Chen Chen, Joseph B Manzano, Ge Gan, Guang R. Gao and Vivek Sarkar, ***A Study of a Software Cache Implementation of the OpenMP Memory Model for Multicore and Manycore Architectures***. In Proceedings of International European Conference on Parallel and Distributed Computing (Euro-Par'10), Ischia, Italy, August 31- September 3, 2010.
  38. Haitao Wei, Junqing Yu, Huafei Yu and Guang R. Gao, ***Minimizing Communication in Rate-Optimal Software Pipelining for Stream Programs***. In proceedings of Symposium on Code Generation and Optimization (CGO 2010), Toronto, Canada, April 24-28, 2010.
  39. Handong Ye, Robert Pavel, Aaron Landwehr and Guang Gao, ***TiNy threads on BlueGene/P: Exploring many-core parallelisms beyond The traditional OS***, Workshop on Multithreaded Architectures and Applications (MTAAP) in the 24th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2010), Atlanta, Georgia, USA, April 23, 2010.
  40. Long Chen, Oreste Villa, Sriram Krishnamoorthy, and Guang Gao, ***Dynamic Load Balancing on Single- and Multi-GPU Systems***, In Proceedings of the 24th IEEE International Parallel & Distributed Processing Symposium, Atlanta, Georgia, USA, April 19-23, 2010.
  41. Long Chen and Guang R. Gao. Performance Analysis of Cooley-Tukey FFT Algorithms for a Many-core Architecture. In Proceedings of the High Performance Computing Symposium (HPC 2010), Orlando, Florida, April 12-15, 2010.
  42. Joseph B. Manzano, Andres Marquez and Guang G. Gao. MODA: A Memory Centric Performance Analysis Tool, 11th LCI International Conference on High-Performance Clustered Computing. Pittsburgh Supercomputing Center, Pittsburgh, Pennsylvania, USA, March 9-11, 2010.
  43. Alejandro Segovia, Xiaoming Li and Guang Gao, Iterative Layer-Based Raytracing on CUDA, Proceedings of International Performance Computing and Communications Conference (IPCCC 2009), Phoenix, Arizona, USA, December, 2009.
  44. Daniel Orozco and Guang R. Gao, Mapping the FDTD Application to Many-Core Chip Architectures, International Conference on Parallel Processing (ICPP'09), Vienna, Austria, September 2009.
  45. Ge Gan, Xu Wang, Joseph Manzano and Guang R. Gao, Tile Percolation: an OpenMP Tile Aware Parallelization Technique for the Cyclops-64 Multicore Processor, International European Conference on Parallel and Distributed Computing (Euro-Par'09), Delft, The Netherlands, August 2009.
  46. Ioannis E. Venetis, Guang R. Gao. Mapping the LU Decomposition on a Many-Core Architecture: Challenges and Solutions, Proceedings of the 2009 ACM International Conference on Computing Frontiers (CF'09), Ischia, Italy, 2009.
  47. Ge Gan, Xu Wang, Joseph Manzano, Guang R. Gao, Tile reduction: the first step towards Openmp tile aware parallelization. The 5<sup>th</sup> International Workshop on OpenMP (IWOMP'09), Dresden, Germany, 2009.
  48. Guangming Tan, Vugranam Sreedhar, Guang Gao, Just-In-Time Locality and Percolation for Optimizing Irregular Applications on a Manycore Architecture, Proceedings of The 21st Annual Languages and Compilers for Parallel Computing Workshop (LCPC'08), 2008.



49. Joseph J. Grzyskia, Alison E. Murraya, Barbara J. Campbell, Mihailo Kaplarevic, Guang R. Gao, Charles Lee, Roy Daniel, Amir Ghadiri, Robert A. Feldman, and Stephen C. Cary, Metagenome analysis of an extreme microbial symbiosis reveals eurythermal adaptation and metabolic flexibility, *Proceedings of the National Academy of Sciences of the United States of America - PNAS*, Volume. 105, no. 45, November 11, 2008.
50. Guangming Tan, Dongrui Fan, Junchao Zhang, Andrew Russo, Guang R. Gao. Experience on Optimizing Irregular Computation for Memory Hierarchy in Manycore Architecture (poster paper). 13th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP'08). 2008.
51. Liping Xue, Long Chen, Ziang Hu, Guang R. Gao, Performance Tuning of the Fast Fourier Transform on a Multi-core Architecture, accepted at the First Workshop on Programmability Issues for Multi-Core Computers (MULTIPROG), Goteborg, Sweden, January 27, 2008.
52. Peiheng Zhang, Guangming Tan, Guang R. Gao, Implementation of the Smith-Waterman algorithm on a reconfigurable supercomputing platform, *Proceedings of the 1st international workshop on High-performance reconfigurable computing technology and applications: held in conjunction with SC07*, Pages 39-48, November 11, 2007.
53. Yuan Zhang, Evelyn Duesterwald and Guang Gao, Concurrency Analysis for Shared Memory Programs with Textually Unaligned Barriers, *Proceedings of The 20th International Workshop on Languages and Compilers for Parallel Computing (LCPC 2007)*, Urbana, Illinois, October 11-13, 2007.
54. Lurng-Kuo Liu, Fei Chen, Christos J. Georgiou and Guang R. Gao, Server I/O Acceleration Using an Embedded Multi-core Architecture, accepted at the Workshop on Application Specific Processors (WASP'07), Salzburg, Austria, October 4, 2007.
55. Alban Douillet and Guang R. Gao, Software-Pipelining on Multi-Core Architectures, *Proceedings of the 16th International Conference on Parallel Architectures and Compilation Techniques (PACT 2007)*, Brasov, Romania, September 15-19, 2007.
56. Weirong Zhu, Vugranam C. Sreedhar, Ziang Hu, and Guang R. Gao, Synchronization State Buffer: Supporting Efficient Fine-Grain Synchronization for Many-Core Architectures, the 34th International Symposium on Computer Architecture (ISCA 2007), Pages: 35 – 45, San Diego, CA, USA, June 9-13, 2007.
57. Guangming Tan, Ninghui Sun and Guang R. Gao, A Parallel Dynamic Programming Algorithm on a Multi-core Architecture, 19th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2007), Pages: 135 – 144, San Diego, CA, USA, June 9 - 11, 2007.
58. Guang R. Gao, Thomas Sterling, Rick Stevens, Mark Hereld and Weirong Zhu, ParalleX: A Study of A New Parallel Computation Model, In *Proceedings of the 21st IEEE International Parallel and Distributed Processing Symposium (IPDPS 2007)*, pp. 1 – 6, Long Beach, CA, USA. March 26 - 30, 2007.
59. Yuan Zhang, Vugranam C. Sreedhar, Weirong Zhu, Vivek Sarkar, Guang R. Gao, Optimized lock assignment and allocation: a method for exploiting concurrency among critical sections, In the *Proceedings of the 12th ACM SIGPLAN symposium on Principles and practice of parallel programming (PPoPP 2007)*, Pages: 146 – 147, San Jose, California, USA, March 14 - 17, 2007.
60. Long Chen, Ziang Hu, Junmin Lin, and Guang R. Gao, Optimizing Fast Fourier Transform on a Multi-core Architecture, *Workshop on Performance Optimization for High-Level Languages and Libraries(POHLL'07)*, in conjunction with 21th International Parallel and Distributed Processing Symposium (IPDPS 2007), Page(s):1 – 8, Long Beach, CA, USA, March 2007.
61. Ge Gan, Ziang Hu, Juan Cuvillo, Guang R. Gao, Exploring a multithreaded methodology to implement a network communication protocol on the Cyclops-64 multithreaded architecture, *First Workshop on Multithreaded Architectures and Applications(MATTP'07)*, in conjunction with 21th International Parallel and Distributed Processing Symposium (IPDPS 2007), Page(s):1 – 8, Long Beach, CA, USA, March 2007.
62. Weirong Zhu, Ziang Hu, and Guang R. Gao, On the Role of Deterministic Fine-Grain Data Synchronization for Scientific Applications: A Revisit in the Emerging Many-Core Era, *First Workshop on Multithreaded Architectures and Applications(MATTP'07)*, in conjunction with

- 21th International Parallel and Distributed Processing Symposium (IPDPS 2007), Page(s):1 – 8, Long Beach, CA, USA, March 2007.
63. Haiping Wu, Eunjung Park, Mihailo Kaplarevic, Yingping Zhang, Murat Bolat, Xiaoming Li, Guang R. Gao, Automatic Program Segment Similarity Detection in Targeted Program Performance Improvement, Workshop on Performance Optimization for High-Level Languages and Libraries(POHLL2007), in conjunction with 21th International Parallel and Distributed Processing Symposium (IPDPS 2007), Page(s):1 – 8, Long Beach, CA, USA, March 2007.
  64. Daniel Orozco, Liping Xue, Murat Bolat, Xiaoming Li, Guang R. Gao, Experience of Optimizing FFT on Intel Core Architecture, Workshop on Performance Optimization for High-Level Languages and Libraries(POHLL'07), in conjunction with 21th International Parallel and Distributed Processing Symposium (IPDPS 2007), Page(s):1 – 8, Long Beach, CA, USA, March 2007.
  65. Weirong Zhu, Parimala Thulasiraman, Ruppa K. Thulasiram and Guang R. Gao, Exploring Financial Applications on Many-core-on-a-chip Architecture: A First Experiment, Workshop on Frontiers of High Performance Computing and Networking (FHPCN2006), in Proceedings of 4th International Symposium on Parallel and Distributed Processing and Applications (ISPA-06) , Sorrento, Italy, Dec.4-7, 2006; (Lecture Notes in Computer Science, Vol. 4331, pp.221-230, 2006).
  66. Alban Douillet, Hongbo Rong, Guang R. Gao, Multidimensional Kernel Generation for Loop Nest Software Pipelining, In the Proceedings of Europar'2006, Dresden, Germany, August-September 2006.
  67. Ziang Hu, Juan del Cuvillo, Weirong Zhu, Guang R. Gao, Optimization of Dense Matrix Multiplication on IBM Cyclops-64: Challenges and Experiences, In the Proceedings of Europar'2006, Dresden, Germany, August-September 2006.
  68. Haiping Wu, Long Chen, Joseph Manzano, Guang R. Gao, A User-Friendly Methodology for Automatic Exploration of Compiler Options, In the Proceedings of the 2006 International Conference on Programming Languages and Compilers (PLC'06), Las Vegas, USA, June 26-29, 2006.
  69. Haiping Wu, Eunjung Park, Long Chen, Juan del Cuvillo, Guang R. Gao, User-Friendly Methodology for Automatic Exploration of Compiler Options: A Case Study on the Intel XScale Microarchitecture, In the Proceedings of the 2006 International Conference on Programming Languages and Compilers (PLC'06), Las Vegas, USA, June 26-29, 2006.
  70. Weirong Zhu, Juan del Cuvillo, and Guang R. Gao, Performance Characteristics of OpenMP Language Constructs on a Many-core-on-a-chip Architecture, the 2nd International Workshop on OpenMP (IWOMP2006), Reims, France, June 12-15, 2006; (Lecture Notes in Computer Science, Vol.4315, pp230-241).
  71. Juan del Cuvillo, Weirong Zhu, Ziang Hu, and Guang R. Gao, Toward a Software Infrastructure for the Cyclops-64 Cellular Architecture, 20th International Symposium on High Performance Computing Systems and Applications, St. John's, Newfoundland and Labrador, Canada, May 14-17, 2006.
  72. Juan del Cuvillo, Weirong Zhu, Guang R. Gao, Landing OpenMP on Cyclops-64: An Efficient Mapping of OpenMP to a many-core System-on-a-chip, ACM International Conference on Computing Frontiers, Ischia, Italy, May 2-5, 2006.
  73. Ying M. P. Zhang, Taikyeong Jeong, Fei Chen, Haiping Wu, Ronny Nitzsche, and Guang R. Gao, A Study of the On-Chip Interconnection Network for the IBM Cyclops-64 Multi-Core Architecture, In the Proceedings of 20th International Parallel and Distributed Processing Symposium (IPDPS2006), Rhodes Island, Greece, April 25 - 29, 2006.
  74. Guang R. Gao, Thomas Sterling, Rick Stevens, Mark Hereld, and Weirong Zhu, Hierarchical Multithreading: Programming Model and System Software, Workshop on NSF Next Generation Software Program (NSFNGS'06), in conjunction with 20th International Parallel and Distributed Processing Symposium (IPDPS2006), Rhodes Island, Greece, April 25 - 29, 2006.
  75. Yanwei Niu, Ziang Hu, Kenneth E. Barner, Guang R. Gao, Performance Modelling and Optimization of Memory Access on Cellular Computer Architecture Cyclops64, Network and Parallel Computing, IFIP International Conference, Beijing, China, November 30 - December 3, 2005.

76. Alban Douillet and Guang R. Gao, Register Pressure in Software-pipelined Loop Nests: Fast Computation and Impact on Architecture Design, In the Proceedings of the 18th International Workshop on Languages and Compilers for Parallel Computing (LCPC'05), Hawthorne, NY, USA, October 2005.
77. Dongrui Fan, Zhimin Tang, Hailin Huang, Guang R. Gao, An Energy Efficient TLB Design Methodology, In the Proceedings of the 2005 International Symposium on Low power electronics and design 2005 (ISLPED'05), San Diego, CA, USA, August 08 - 10, 2005.
78. Haiping Wu, Ziang Hu, Joseph Manzano Yingping Zhang and Guang R. Gao, Identifying Multiply-Add Operations in Kylin Compiler, Proceedings of the 2005 International Conference on Embedded Systems and Applications(ESA'05), Las Vegas, Nevada, USA, June 27-30, 2005
79. Hongbo Rong, Alban Douillet and Guang R. Gao, Register Allocation for Software Pipelined Multi-dimensional Loops, Proceedings of the 2005 ACM SIGPLAN conference on Programming language design and implementation 2005, Chicago, IL, USA June 12 - 15, 2005.
80. Juan del Cuvillo, Weirong Zhu, Ziang Hu and Guang R. Gao, FAST: A Functionally Accurate Simulation Toolset for the Cyclops-64 Cellular Architecture, Workshop on Modeling, Benchmarking and Simulation (MoBS), held in conjunction with the 32nd Annual International Symposium on Computer Architecture (ISCA'05), Madison, Wisconsin, June 4, 2005.
81. Joseph B. Manzano, Yuan Zhang and Guang R. Gao, P3I: The Delaware Programmability, Productivity and Proficiency Inquiry, Proceedings of the Second International Workshop On Software Engineering for High Performance Computing System Applications (SE-HPCS '05), St. Louis, Missouri, May 15, 2005.
82. Yuan Zhang, Joseph B. Manzano and Guang R. Gao, Atomic Section: Concept and Implementation, Mid-Atlantic Student Workshop on Programming Languages and Systems (MASPLAS '05), Newark, Delaware, April 30, 2005.
83. Weirong Zhu, Yanwei Niu and Guang R. Gao, Performance Portability on EARTH: A Case Study across Several Parallel Architectures, The 4th International Workshop on Performance Modeling, Evaluation, and Optimization of Parallel and Distributed Systems(PMEO-PDS'05), conjuncted with IPDPS 2005, Denver, Colorado, USA, April 4 - 8, 2005.
84. Juan del Cuvillo, Weirong Zhu, Ziang Hu, Guang R. Gao, TiNy Threads: a Thread Virtual Machine for the Cyclops64 Cellular Architecture, The 19th International Parallel and Distributed Processing System, Denver, Colorado, April 3-8, 2005
85. Yuan Zhang, Weirong Zhu, Fei Chen, Ziang Hu, Guang R. Gao, Sequential Consistency Revisit: The Sufficient Condition and Method to Reason The Consistency Model of a Multiprocessor-On-A-Chip Architecture, The Twenty-Third IASTED International Conference on Parallel and Distributed Computing and Networks (PDCN 2005) Innsbruck, Austria, February 15 - 17, 2005
86. P. Thiagarajan, P. Chen, K. Steiner, G. Gao and K. Barner, Segmenting Deformable Surface Models Using Haptic Feedback, In Proceedings of Medicine Meets Virtual Reality, January 12, 2005.
87. Khasay, R., Liao, L., Gao, Guang R., An Improved Hidden Markov Model for Transmembrane Protein Topology Prediction. ICTAI'04 (16th IEEE International Conference on Tools with Artificial Intelligence), Boca Raton, FL, USA, Nov, 2004.
88. Fei Chen, Kevin B. Theobald, and Guang R. Gao. Implementing Parallel Conjugate Gradient on the EARTH Multithreaded Architecture, IEEE International Conference on Cluster Computing (CLUSTER 2004), San Diego, CA, September, 2004.
89. Yanwei Niu, Ziang Hu and, Guang R. Gao, Parallel Reconstruction for Parallel Imaging SPACE RIP on Cellular Computer Architecture, The 16th IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS 2004), Cambridge, MA, USA, November 9-11, 2004.
90. Arthur Stoutchinin and Guang R. Gao, If-Conversion in SSA Form, Proceedings of Euro-Par 2004, Pisa, Italy, Aug. 31 - Sept. 3, 2004.
91. Hongbo Rong, Zhizhong Tang, R.Govindarajan, Alban Douillet, and Guang R.Gao, Single-Dimension Software Pipelining for Multi-Dimensional Loops, Proceedings of the 2004 International Symposium on Code Generation and Optimization with Special Emphasis on

- Feedback-Directed and Runtime Optimization (CGO-2004), Pages: 163-174, Palo Alto, California, March 20-24, 2004.
92. Hongbo Rong, Alban Douillet, R. Govindarajan, and Guang R. Gao, Code Generation for Single-Dimension Software Pipelining of Multi-Dimensional Loops, Proceedings of the 2004 International Symposium on Code Generation and Optimization with Special Emphasis on Feedback-Directed and Runtime Optimization (CGO-2004), Pages: 175-186, Palo Alto, California, March 20-24, 2004.
  93. Hirofumi Sakane, Levent Yakay, Vishal Karna, Clement Leung and Guang R. Gao, DIMES: An Iterative Emulation Platform for Multiprocessor-System-on-Chip Designs, Proceedings of the IEEE International Conference on Field-Programmable Technology (ICFTP'03), Pages: 244-251, Tokyo, Japan, December 15-17, 2003.
  94. Weirong Zhu, Yanwei Niu, Jizhu Lu, Chuan Shen, and Guang R. Gao, A Cluster-Based Solution for High Performance Hmmpfam Using EARTH Execution Model, Proceedings of the Fifth IEEE International Conference on Cluster Computing (CLUSTER2003), Pages: 30-37, Hong Kong, P.R. China, December, 2003.
  95. Ziang Hu, Yan Xie, Ramaswamy Govindarajan, and Guang R. Gao, Code Size Oriented Memory Allocation for Temporary Variables, Proceedings of the Fifth Workshop on Media and Streaming Processors (MSP-5/MICRO-36), San Diego, California, December 1, 2003.
  96. Ziang Hu, Yuan Zhang, Hongbo Yang and Guang. R. Gao, Code Size Reduction with Global Code Motion, Workshop on Compilers and Tools for Constrained Embedded Systems (CTCES/CASES) 2003, San Jose, California, Oct. 29, 2003.
  97. Juan del Cuvillo, Xinmin Tian, Guang R. Gao, and Milind Girkar, Performance Study of a Whole Genome Comparison Tool on a Hyper-Threading Multiprocessor, Proceedings of the Fifth International Symposium on High Performance Computing, Pages: 450-457, Tokyo, Japan, October 20-22, 2003.
  98. Andres Marquez and Guang R. Gao, CARE: Overview of an Adaptive Multithreaded Architecture, Proceedings of the Fifth International Symposium on High Performance Computing, Pages: 26-38, Tokyo, Japan, October 20-22, 2003.
  99. Hongbo Yang, Ramaswamy Govindarajan, Guang R. Gao and Ziang Hu, Compiler-Assisted Cache Replacement: Problem Formulation and Performance Evaluation, Proceedings of the 16th International Workshop on Languages and Compilers for Parallel Computing(LCPC'03), Pages: 77-92, College Station, Texas, October, 2003
  100. Liu Yang, Sun Chan, Guang R. Gao, Roy Ju, Guei-Yuan Lueh, and Zhaoqing Zhang, Inter-Procedural Stacked Register Allocation for Itanium Like Architecture, Proceedings of the 17th Annual ACM/IEEE International Conference on Supercomputing, Pages: 215-225, San Francisco, CA, USA, June 23-26, 2003.
  101. Adeline Jacquet, Vincent Janot, Clement Leung, Guang R. Gao, Ramaswamy Govindarajan, and Thomas L. Sterling, An Executable Analytical Performance Evaluation Approach for Early Performance Prediction, Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS'03), Nice, France, April 22 - 26, 2003.
  102. Guang R. Gao, Kevin B. Theobald, Ramaswamy Govindarajan, Clement Leung, Ziang Hu, Haiping Wu, Jizhu Lu, Juan del Cuvillo, Adeline Jacquet, Vincent Janot, and Thomas L. Sterling, Programming Models and System Software for Future High-End Computing Systems: Work-in-Progress, Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS'03), Nice, France, April 22 - 26, 2003.
  103. Praveen Thiagarajan and Guang R Gao, Visualizing Biosequence data using Texture Mapping, IEEE Symposium on Information Visualization (InfoVis 2002), Pages: 103-109, Boston Massachusetts, October 28-29, 2002.
  104. Hongbo Yang, Guang R. Gao, and Clement Leung, On Achieving Balanced Power Consumption in Software Pipelined Loops, Proceedings of the 2002 International Conference on Compilers, Architecture and Synthesis for Embedded Systems(CASES), Grenoble, France, Oct 8-11, 2002.
  105. Hongbo Yang, Ramaswamy Govindarajan, Guang R. Gao, George Cai and Ziang Hu, Exploiting Schedule Slacks for Rate-Optimal Power-Minimum Software Pipelining, Proceedings of the 3rd Workshop on Compilers and Operating Systems for Low Power (COLP'02), Conjunction with



- The 11th International Conference on Parallel Architecture and Compilation Techniques (PACT'02), Charlottesville, Virginia, Sept 22 - 25, 2002.
106. Hongbo Yang, Ramaswamy Govindarajan, Guang R. Gao, and Kevin B. Theobald, Power-Performance Trade-offs for Energy-Efficient Architectures: A Quantitative Study, Proceedings of the 20th International Conference on Computer Design(ICCD), Freiburg, Germany, September 16-18, 2002.
  107. Javier Garcia-Frias, Yujing Zeng, Jianshan Tang, and Guang R Gao, An Adaptive Meta-Clustering Approach: Combining the Information from Different Clustering Results, Proceedings of the IEEE Computer Society Bioinformatics Conference (CSB'02), Stanford, California, August 14 - 16, 2002.
  108. Alban Douillet, José Nelson Amaral, Guang R. Gao, Fine-Grain Stacked Register Allocation for the Itanium Architecture, Proceeding of 15th Workshop on Languages and Compilers for Parallel Computing College Park, Pages: 345-361, Maryland, July, 2002.
  109. Rishi Kumar, Gagan Agrawal, and Guang R. Gao, Compiling several classes of Communication Patterns on a Multithreaded Architecture, Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS'02), Fort Lauderdale, California, April 15 - 19, 2002.
  110. Eduard Ayguadé, Fredrik Dahlgren, Christine Eisenbeis, Roger Espasa, Guang R. Gao, Henk L. Muller, Rizos Sakellariou, André Seznez, Topic 08+13: Instruction-Level Parallelism and Computer Architecture, Proceedings of the 7th International Euro-Par Conference Manchester on Parallel Processing , Page: 385, Lecture Notes In Computer Science; Vol. 2150, 2001
  111. G.R. Gao, Bridging the gap between ISA compilers and silicon compilers: a challenge for future SoC design, Proceedings of The 14th International Symposium on System Synthesis, Page: 93, Montreal, Canada, October 1-3, 2001
  112. Wellington S. Martins, Juan del Cuvillo, Wenwu Cui, and Guang R Gao, Whole Genome Alignment using a Multithreaded Parallel Implementation, Proceedings of the 13th Symposium on Computer Architecture and High Performance Computing, Pirenopolis, Pages: 1-8, Brazil, September 10-12, 2001.
  113. Hongbo Yang, Guang R.Gao, Andres Marquez, George Cai, and Ziang Hu, Power and Energy Impact by Loop Transformations, Proceedings of the Workshop on Compilers and Operating Systems for Low Power (COLP) 2001, held in conjunction with Parallel Architecture and Compilation Techniques (PACT) 2001, Barcelona, SPAIN, Sept 8 - 12, 2001.
  114. Christopher J. Morrone, José N Amaral, Guy Tremblay, and Guang R. Gao, A Multi-Threaded Runtime System for a Multi-Processor/Multi-Node Cluster, Proceedings of the 15th Annual IEEE International Symposium on High Performance Computing Systems and Applications, Windsor, ON, Canada, June 18-20, 2001.
  115. Rishi Kumar, Gagan Agrawal, Kevin Theobald, Gary M. Zoppetti, and Guang R. Gao, Compiling Several Classes of Reductions on a Multithreaded Architecture, Proceedings of Mid-Atlantic Student Workshop on Programming Languages and Systems 2001, IBM Watson Research Center, Hawthorne, USA, April 27, 2001.
  116. Ruppa K. Thulasiram, Lybomir Litov, Hassan Nojumi, Chris Downing, and Guang R. Gao, Multithreaded Algorithms for Pricing a Class of Complex Options, Proceedings of the 15th International Parallel and Distributed Processing Symposium, Page: 18, San Francisco, CA, April 23 - 27, 2001.
  117. Ramaswamy Govindarajan, Hongbo Yang, José N. Amaral, Chihong Zhang and Guang R. Gao, Minimum Register Instruction Sequence Problem: Revisiting Optimal Code Generation for DAGs, Proceedings of the 15th International Parallel and Distributed Processing Symposium, Page: 26 San Francisco, April 23-27, 2001.
  118. Ruppa K. Thulasiram, Lubomir Litov, Hassan Nojumi, Christopher T. Downing, Guang R. Gao: Multithreaded Algorithms for Pricing a Class of Complex Options, Proceedings of the 15th International Parallel & Distributed Processing Symposium, Pages: 18, San Francisco, CA, April 23-27, 2001
  119. Juan Del Cuvillo, Wellington S. Martins, Guang R Gao, Wenwu Cui and Sun Kim, ATGC -Another Tool for Genome Comparison, Currents in Computational Molecular Biology 2001, Pages: 13-14, Montreal, April 22 - 25, 2001.

120. Artour Stoutchinin, José N Amaral, Guang R. Gao, Jim Dehnert, Suneel Jain, Alban Douillet, Speculative Prefetching of Induction Pointers, Proceedings of the 10th International Conference on Compiler Construction (with ETAPS 2001), Pages: 289-303, Genova, Italy, April 2 - 6, 2001.
121. Francisco Jose Useche, M. Morgante, M. Hanafey, Scott Tingey, Wellington S. Martins, Guang R Gao, Antoni Rafalski, Computer Detection of Single Nucleotide Polymorphisms (SNPs) in Maize ESTs, Plant & Animal Genome IX Conference, San Diego, CA. January 13 - 17, 2001.
122. Wellington S. Martins, Juan del Cuvillo, Francisco Jose Useche, Kevin B. Theobald, and Guang R. Gao, A Multithreaded Parallel Implementation of a Dynamic Programming Algorithm for Sequence Comparison, Proceedings of the 6th Pacific Symposium on Biocomputing (PSB 2001), Pages 311-322, Mauna Lani, Hawaii, January 3 - 7, 2001
123. Kevin B. Theobald, Gagan Agrawal, Rishi Kumar, Gerd Heber, Guang R. Gao, Paul Stodghill, and Keshav Pingali, Landing CG on EARTH: A Case Study of Fine-Grained Multithreading on an Evolutionary Path, Proceedings of SC2000: High Performance Networking and Computing, Dallas, Texas, November 4 - 10, 2000
124. José N. Amaral, Guang R. Gao, Erturk Dogan Kocalar, Patrick O'Neill, Xinan Tang, Design and Implementation of an Efficient Thread Partitioning Algorithm, Proceedings of the 3rd International Symposium on High Performance Computing, Pages: 252-259, Kyoto, Japan, October 2000.
125. Kevin B. Theobald, Rishi Kumar, Gagan Agrawal, Gerd Heber, Ruppa K. Thulasiram and Guang R. Gao, Developing a Communication Intensive Application on EARTH Multithreaded Architecture, A Distinguished Paper in the Proceedings of Euro-Par 2000, Pages: 625-637, Munchen, Germany, August 2000.
126. Ramaswamy Govindarajan, Erik R. Altman, and Guang R. Gao, A Theory for Software-Hardware Co-Scheduling for ASIPs and Embedded Processors, Proceedings of the IEEE International Conference on Application-Specific Systems, Architectures and Processors (ASAP'2000), Pages: 329-339, Boston, MA, July 10 - 12, 2000.
127. Parimala Thulasiraman, Kevin B Theobald, Ashfaq A. Khokhar, and Guang R. Gao, Multithreaded Algorithms for the Fast Fourier Transform, Proceedings of the 12th Symposium on Parallel Algorithms and Architectures (SPAA), Pages 176-185, Bar Harbor, ME, June 2000.
128. Ruppa K. Thulasiram, Christopher Downing, and Guang R. Gao, Recursive and Iterative Multithreaded Algorithms for Pricing American Securities, Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications, Pages:1571-1577, Las Vegas, June 26-29, 2000.
129. Ruppa K. Thulasiram, Christopher Downing and Guang R. Gao, A Multithreaded Parallel Algorithm for Pricing American Securities, Proceedings (CD-RoM) of the Computational Finance 2000 Conference, London, UK, May/June, 2000.
130. Gary M. Zoppetti, Gagan Agrawal, Lori Pollock, Jose Nelson Amaral, Xinan Tang and Guang Gao, Automatic compiler techniques for thread coarsening for multithreaded architectures, Proceedings of the 14th international conference on Supercomputing, Pages: 306-315, Santa Fe, NM, May 8-11, 2000.
131. Wen-Yen Lin, José N. Amaral, Jean-Luc Gaudiot, and Guang R. Gao, Caching Single-Assignment Structures to Build a Robust Fine-Grain Multi-Threading System, Proceedings of the International Parallel and Distributed Processing Symposium, Pages: 589-594, Cancun, Mexico, May 1-5, 2000.
132. Bruce Carter, Chuin-Shan Chen, L. Paul Chew, Nikos Chrisochoides, Guang R. Gao, Gerd Heber, Anthony R. Ingraffea, Roland Krause, Chris Myers, Démian Nave, Keshav Pingali, Paul Stodghill, Stephen A. Vavasis, Paul A. Wawrzynek: Parallel FEM Simulation of Crack Propagation - Challenges, Status, and Perspectives, IPDPS Workshops: Irregular 2000 - Workshop on Solving Irregularly Structured Problems in Parallel 2000, Pages: 443-449, Cancun, Mexico, May 1-5, 2000.
133. Wen-Yen Lin, Jean-Luc Gaudiot, José N Amaral, and Guang R. Gao, Do Software Caches Work? Performance Analysis of the I-Structure Software Cache on Multi Threading Systems,

- Proceedings of the 19th IEEE International Performance, Computing, and Communications Conference (IPCCC 2000), Pages: 83-89, Phoenix, Arizona, February, 2000.
134. Prasad Kakulavarapu, Christopher J. Morrone, Kevin B. Theobald, José N Amaral, and Guang R. Gao, A Comparative Performance Study of Fine-Grain Multi-threading on Distributed Memory Machines, Proceedings of the 9th IEEE International Performance, Computing, and Communications Conference - IPCCC2000, Pages: 590-596, Phoenix, Arizona, February, 2000.
  135. Ramaswamy Govindarajan, Chihong Zhang, Guang R. Gao: Minimum Register Instruction Scheduling: A New Approach for Dynamic Instruction Issue Processors. Proceeding of the 12th International Workshop Languages and Compilers for Parallel Computing (LCPC'1999), Pages: 70-84, La Jolla/San Diego, CA, USA, August 4-6, 1999.
  136. Sean Ryan, José N. Amaral, Guang R. Gao, Zachary Ruiz, Andres Marquez, and Kevin B. Theobald, Coping with Very High Latencies in Petaflop Computer Systems, Proceedings of the 2nd International Symposium on High Performance Computing, Pages: 71-82, Kyoto, Japan, May 1999.
  137. Gerd Heber, Rupak Biswas, and Guang R. Gao, Self-Avoiding Walks over Adaptive Triangular Grids, Proceedings of the 9th SIAM Parallel Processing Conference for Scientific Computing, San Antonio, Texas, April, 1999.
  138. Shigeru Kusakabe, Kentaro Inenaga, Makoto Amamiya, Xinan Tang, Andres Marquez, Guang R. Gao, Implementing a Non-Strict Functional Programming Language on a Threaded Architecture, Proceedings of the 11 IPPS/SPDP'99 Workshops Held in Conjunction with the 13th International Parallel Processing Symposium and 10th Symposium on Parallel and Distributed Processing (IPPS/SPDP), Pages: 138-152, San Juan, Puerto Rico, April 12-16, 1999.
  139. G. Heber, R. Biswas, G.R. Gao, A new approach to parallel dynamic partitioning for adaptive unstructured meshes, Proceedings of the 11 IPPS/SPDP'99 Workshops Held in Conjunction with the 13th International Parallel Processing Symposium and 10th Symposium on Parallel and Distributed Processing (IPPS/SPDP), Pages: 360-364, San Juan, Puerto Rico, April 12-16, 1999.
  140. Ashfaq A. Khokhar, Gerd Heber, Parimala Thulasiraman and Guang R. Gao, Load Adaptive Algorithms and Implementation for the 2D Discrete Wavelet Transform on Fine-Grain Multithreaded Architectures, Proceedings of the 11 IPPS/SPDP'99 Workshops Held in Conjunction with the 13th International Parallel Processing Symposium and 10th Symposium on Parallel and Distributed Processing (IPPS/SPDP), Pages: 458-462, San Juan, Puerto Rico, April 12-16, 1999.
  141. Gerd Heber, Rupak Biswas, and Guang R. Gao, Self-Adaptive Walks over Adaptive Unstructured Grids, Proceedings of Irregular '99, in conjunction with the International Parallel Processing Symposium (IPPS/SPDP), Pages: 969-977, San Juan, Puerto Rico, April 12-16, 1999.
  142. Gerd Heber, Rupak Biswas, Parimala Thulasiram and Guang R. Gao, Using Multithreading for Automatic Load Balancing of Adaptive Finite Element Meshes, Proceedings of Irregular '99, in conjunction with the International Parallel Processing Symposium (IPPS/SPDP), Pages: 969-977, San Juan, Puerto Rico, April 12-16, 1999.
  143. Chihong Zhang, Ramaswamy Govindarajan, and Guang R. Gao, Efficient State-Diagram Construction Methods for Software Pipelining, Proceedings of the 8th International Conference on Compiler Construction (CC'99), held as part of ETAPS'99, Amsterdam, The Netherlands, March 22 - 26, 1999.
  144. José N. Amaral, Guang R. Gao, Phillip Merkey, Thomas Sterling, Zachary Ruiz, and Sean Ryan, Performance Prediction for the HTMT: A Programming Example, Proceedings of the 3rd PetaFLOPS Workshop 3, Pages: 25-31, Annapolis, Maryland, February 22, 1999
  145. Kevin B Theobald, Guang R. Gao, and Thomas L. Sterling, Superconducting Processors for HTMT: Issues and Challenges, Proceedings of The 7th Symposium on The Frontiers of Massively Parallel Computation (Frontiers'99), Pages: 260-267, Annapolis, Maryland, February 21-25, 1999.
  146. Haiying Cai, Olivier Maquelin, Prasad Kakulavarapu, and Guang R. Gao, Design and Evaluation of Dynamic Load Balancing Schemes under a Fine-Grain Multithreaded Execution Model, Proceedings of the Workshop on Multithreaded Execution, Architecture and Compilation



- (MTEAC), in conjunction with the 1999 IEEE Symposium on High-Performance Computer Architecture (HPCA99), Orlando, Florida, January, 1999.
147. Andres Marquez, Kevin B. Theobald, Xinan Tang and Guang R. Gao, The Superstrand Model, Proceedings of the Workshop on Multithreaded Execution, Architecture and Compilation (MTEAC), in conjunction to the 1999 IEEE Symposium on High-Performance Computer Architecture (HPCA99), Orlando, Florida, January, 1999.
  148. Xinan Tang and Guang R. Gao, How "Hard" is Thread Partitioning and How "Bad" is a List Scheduling Based Partitioning Algorithm, Proceedings of 10th Annual ACM Symposium on Parallel Algorithms and Architectures, Puerto Vallarta, Mexico, Pages: 130-139, June 1998.
  149. Ramaswamy Govindarajan, Narasimha Rao, Erik R. Altman, and Guang R. Gao, An Enhanced Co-Scheduling Method using Reduced MS-State Diagrams, Proceedings of the 12th International Parallel Processing Symposium (IPPS/SPDP), Pages: 168-175, Orlando, Florida, April 1998.
  150. Sylvain Lelait, Guang R. Gao, and Christine Eisenbeis, A New Fast Algorithm for Optimal Register Allocation in Modulo Scheduled Loops, Proceedings of the 7th International Conference on Compiler Construction, CC'98, held as part of ETAPS'98, 1998, Kai Koskimies, Vol. 1383, Lecture Notes in Computer Science, Pages: 204-218, Springer, Lisbon, Portugal, March 28 – April 4, 1998.
  151. D. Vengroff, G. Gao, Partial Sampling with Reverse State Reconstruction: A New Technique for Branch Predictor Performance Estimation, Proceedings of the Fourth International Symposium on High-Performance Computer Architecture (HPCA'98), Page: 342, Las Vegas, NV, February 01-04 1998.
  152. Rauls Silvera, Jian Wang, Guang R. Gao and Ramaswamy Govindarajan, A Register Pressure Sensitive Instruction Scheduler for Dynamic Issue Processors, Proceedings of the International Conference on Parallel Architecture and Compilation Techniques (PACT'97), San Francisco, CA, Nov. 1997.
  153. Xinan Tang, Rakesh Ghiya, Laurie J. Hendren, and Guang R. Gao, Heap Analysis and Optimizations for Threaded Programs, Proceedings of the International Conference on Parallel Architecture and Compilation Techniques (PACT'97), Pages: 14-25, San Francisco, CA, Nov. 1997.
  154. Guang R. Gao and Vivek Sarkar, On the Importance of an End-To-End View of Memory Consistency in Future Computer Systems, Proceedings of the 1997 International Symposium on High Performance Computing, Fukuoka, Japan, November 1997.
  155. Maria-Dana Tarlescu, Kevin B. Theobald, and Guang R. Gao, Elastic History Buffer: A Low Cost Method to Improve Branch Prediction Accuracy, Proceedings of the International Conference on Computer Design (ICCD'97), Pages: 82-87, Austin, TX, Oct. 1997.
  156. Xinan Tang, Jian Wang, Kevin B Theobald, and Guang R. Gao, Thread Partition and Schedule Based on Cost Model, Proceedings of the 9th Annual Symposium on Parallel Algorithms and Architectures (SPAA), Pages: 272-281, Newport, RI, July 22, 1997.
  157. Angela Sodan, Guang R. Gao, Olivier Maquelin, Jens-Uwe Schultz, and Xin-Min Tian, Experiences with Non-numeric Applications on Multithreaded Architectures, Proceedings of the 6th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, Las Vegas, NV, Pages: 124-135, June 1997.
  158. Shashank Nemawarkar and Guang R. Gao, Latency tolerance: A Metric for Performance Analysis of Multithreaded Architecture. Proceedings of the 11th International Parallel Processing Symposium, Pages: 227-232, Geneva, Switzerland, Apr. 1997.
  159. Parimala Thulasiraman, Xinmin Tian, and Guang R. Gao, Multithreading Implementation of a Distributed Shortest Path Algorithm on EARTH Multiprocessor. Proceedings of the International Conference on High Performance Computing, Trivandrum, India, Pages: 336-341, December 1996.
  160. Xinmin Tian, Shashank Nemawarkar, Guang R. Gao, et al., Quantitative Studies of Data Locality Sensitivity on the EARTH Multithreaded Architecture: Preliminary Results, Proceedings of the International Conference on High Performance Computing, Trivandrum, India, Pages: 362-367, December 1996.
  161. Guang R. Gao, Konstantin K. Likharev, Paul C. Messina, and Thomas L. Sterling, Hybrid Technology Multi-threaded Architecture, Proceedings of Frontiers '96: The Sixth Symposium

- on the *Frontiers of Massively Parallel Computation*, Pages: 98-105, Annapolis, Maryland, October 1996.
162. Laurie J. Hendren, Xinan Tang, Yingchun Zhu, Guang R. Gao, Xun Xue, Haiying Cai, and Pierre Ouellet, *Compiling C for the EARTH Multithreaded Architecture*, Proceedings of the 1996 Conference on Parallel Architectures and Compilation Techniques (PACT '96), Pages: 12-23, Boston, Massachusetts, IEEE Computer Society Press, October 1996.
  163. Erik R. Altman and Guang R. Gao, *Optimal Software Pipelining Through Enumeration of Schedules*, Proceedings of Euro-Par'96, Pages: 833-840, Lyon, France, August 1996.
  164. Vivek Sarkar, Guang R. Gao, and Shaohua Han, *Locality Analysis for Distributed Shared Memory Multiprocessors*, Proceedings of the Ninth Workshop on Languages and Compilers for Parallel Computing, Pages: 20-40, San Jose, California, August 1996.
  165. John C. Ruttenberg, Guang R. Gao, Artour Stouchinin, and Woody Lichtenstein, *Software Pipelining Showdown: Optimal vs. Heuristic Methods in a Production Compiler*, Proceedings of the ACM SIGPLAN '96 Conference on Programming Language Design and Implementation, Pages: 1-11, Philadelphia, Pennsylvania, May 1996.
  166. Olivier Maquelin, Guang R. Gao, Herbert H. J. Hum, Kevin B. Theobald, and Xinmin Tian, *Polling Watchdog: Combining Polling and Interrupts for Efficient Message Handling*, Proceedings of the 23rd Annual International Symposium on Computer Architecture, pages 178-188, Philadelphia, Pennsylvania, May 1996.
  167. Vugranam C. Sreedhar, Guang R. Gao, and Yongfong Lee, *A New Framework for Exhaustive and Incremental Dataflow Analysis Using DJ graphs*, Proceedings of the ACM SIGPLAN '96 Conference on Programming Language Design and Implementation, pages 278-290, Philadelphia, Pennsylvania, May 1996.
  168. Jian Wang and Guang R. Gao, *Pipelining-Dovetailing: A Transformation to Enhance Software Pipelining for Nested Loops*, Proceedings of the 6th International Conference on Compiler Construction, Lecture Notes in Computer Science, Linkoping, Sweden, Springer-Verlag, April 1996.
  169. Shashank Nemawarkar and Guang R. Gao, *Measurement and Modeling of ARTH-MANNA Multithreaded Architecture*. Proceedings of the Fourth International Workshop on Modeling, Analysis and Simulation of Computer and Telecommunication Systems, pages 109-114, San Jose, California, IEEE Computer Society TCCA and TCS, February 1996.
  170. Ramaswamy Govindarajan, Erik R. Altman, and Guang R. Gao, *Co-scheduling Hardware and Software Pipelines*, Second International Symposium on High-Performance Computer Architecture, San Jose, California, February 1996.
  171. Ramaswamy Govindarajan, Erik R. Altman, and Guang R. Gao, *Instruction Scheduling in the Presence of Structural Hazards: An Integer Programming Approach to Software Pipeline*, Proceedings of the International Conference on High Performance Computing, Goa, India, December 1995.
  172. Luis A. Lozano C. and Guang R. Gao, *Exploiting Short-lived Variables in Superscalar Processors*, Proceedings of the 28th Annual IEEE/ACM International Symposium on Microarchitecture, pages 292-302, Ann Arbor, Michigan, November - December 1995.
  173. Jack B. Dennis and Guang R. Gao, *On Memory Models and Cache Management for Shared-memory Multi-processors*, Proceedings of Seventh IEEE International Symposium on Parallel and Distributed Processing. IEEE, October 1995.
  174. Olivier Maquelin, Herbert H. J. Hum, and Guang R. Gao, *Costs and Benefits of Multithreading with Off-the-shelf RISC Processors*, Proceedings of the First International EURO-PAR Conference, number 966 in Lecture Notes in Computer Science, Pages: 117-128, Stockholm, Sweden, Springer-Verlag, August 1995.
  175. Erik R. Altman, Ramaswamy Govindarajan, and Guang R. Gao, *An Experimental Study of an ILP-based Exact Solution Method for Software Pipelining*, Proceedings of the 8th International Workshop on Languages and Compilers for Parallel Computing, Lecture Notes in Computer Science, Pages: 2.1 - 2.15, Columbus, Ohio, Springer-Verlag, August 1995.
  176. Guang R. Gao and Vivek Sarkar, *Location consistency: Stepping beyond the memory coherence barrier*, 24th International Conference on Parallel Processing, Pages: II-73 - II-76, University Park, Pennsylvania, August 1995.

177. Renhua Wen, Guang R. Gao, and Vincent V. Dongen, The Design and Implementation of the Accurate Array Data-flow Analysis in the HPC Compiler, Proceedings of High Performance Computing Symposium '95, Canada's Ninth Annual International High Performance Computing Conference and Exhibition, pages 144-155, Montreal, Quebec, Centre de recherche informatique de Montreal, July 1995.
178. Nasser Elmasri, Herbert H. J. Hum, and Guang R. Gao, The Threaded Communication Library: Preliminary Experiences on a Multiprocessor with Dual-processor Nodes. Conference Proceedings, 1995 IEEE/ACM International Conference on Supercomputing, Pages: 195-199, Barcelona, Spain, July 1995.
179. Herbert H. J. Hum, Olivier Maquelin, Kevin B. Theobald, Xinmin Tian, Xinan Tang, Guang R. Gao, Phil Cupryk, Nasser Elmasri, Laurie J. Hendren, Alberto Jimenez, Shoba Krishnan, Andres Marquez, Shamir Merali, Shashank Nemawarkar, Prakash Panangaden, Xun Xue, and Yingchun Zhu, A Design Study of the EARTH multiprocessor, Proceedings of the IFIP WG 10.3 Working Conference on Parallel Architectures and Compilation Techniques, PACT '95, pages 59-68, Limassol, Cyprus, ACM Press, June 1995.
180. Erik R. Altman, Ramaswamy Govindarajan, and Guang R. Gao, Scheduling and Mapping: Software Pipelining in the Presence of Structural Hazards, ACM SIGPLAN Symposium on Programming Language Design and Implementation, Page 139-150, June 1995.
181. Vugranam C. Sreedhar, Guang R. Gao, and Yong fong Lee, Incremental Computation of Dominator Trees, Proceedings of the ACM SIGPLAN Workshop on Intermediate Representations (IR'95), Pages: 1-12, San Francisco, California, January 22, 1995. SIGPLAN Notices, 30(3), March 1995.
182. Guy Tremblay and Guang R. Gao, The Impact of Laziness on Parallelism and the Limits of Strictness Analysis, Proceedings of the High Performance Functional Computing Conference, Pages: 119- 133, Denver, Colorado, Lawrence Livermore National Laboratory. CONF-9504126, April 1995.
183. Vugranam C. Sreedhar and Guang R. Gao, A Linear Time Algorithm for Placing phi-nodes, Conference Record of the 22nd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, Pages 62 - 73, San Francisco, California, January 1995.
184. Kevin B. Theobald, Herbert H. J. Hum, and Guang R. Gao, A Design Framework for Hybrid-access Caches. Proceedings of the First International Symposium on High-Performance Computer Architecture, Pages: 144 - 153, Raleigh, North Carolina, January 1995.
185. Ivan Kalas, Eshrat Arjomandi, Guang R. Gao, Bill O'Farrell, FTL: a multithreaded environment for parallel computation, Proceedings of the 1994 conference of the Centre for Advanced Studies on Collaborative research, Page: 33, Toronto, Ontario, Canada, 1994.
186. Gilles Hurteau, Vincent Van Dongen, Guang R. Gao, EPPP - an integrated environment for portable parallel programming, Proceedings of the 1994 conference of the Centre for Advanced Studies on Collaborative research, Page: 31, Toronto, Ontario, Canada, 1994
187. Guoning Liao, Erik R. Altman, Vinod K. Agarwal, and Guang R. Gao, A Comparative Study of DSP Multiprocessor List Scheduling Heuristics, Proceedings of the 27th Annual Hawaii International Conference on System Sciences, Kihei, Hawaii, 1994.
188. Ramaswamy Govindarajan, Erik R. Altman, and Guang R. Gao, Minimizing Register Requirements under Resource-constrained Rate-optimal Software Pipelining, Proceedings of the 27th Annual IEEE/ACM International Symposium on Microarchitecture, Pages: 85 - 94, San Jose, California, November-December 1994.
189. Ramaswamy Govindarajan, Erik R. Altman, and Guang R. Gao, A Framework for Resource-constrained Rate-optimal Software Pipelining, Proceedings of the Third Joint International Conference on Vector and Parallel Processing (CONPAR 94 - VAPP VI), number 854 in Lecture Notes in Computer Science, Pages: 640 - 651, Linz, Austria, Springer-Verlag, September 1994.
190. Ramaswamy Govindarajan, Guang R. Gao, and Palash Desai, Minimizing Memory Requirements in Rate Optimal Schedules, Proceedings of the 1994 International Conference on Application Specific Array Processors, Pages: 75-86, San Francisco, California, IEEE Computer Society, August 1994.
191. Shashank Nemawarkar, Ramaswamy Govindarajan, Guang R. Gao, and Vinod K. Agarwal, Performance of Interconnection Network in Multithreaded Architectures, Proceedings of

- PARLE '94 - Parallel Architectures and Languages Europe, number 817 in Lecture Notes in Computer Science, Pages: 823-826, Athens, Greece, Springer-Verlag, July 1994.
192. Vincent Van Dongen, Christophe Bonello, and Guang R. Gao, Data Parallelism with High Performance C, Proceedings of Supercomputing Symposium '94, Canada's Eighth Annual High Performance Computing Conference, Pages: 128-135, Toronto, Ontario, University of Toronto, June 1994.
  193. Herbert H. J. Hum, Kevin B. Theobald, and Guang R. Gao, Building Multithreaded Architectures with Off-the-shelf microprocessors, Proceedings of the 8th International Parallel Processing Symposium, Pages 288-294, Cancun, Mexico, IEEE Computer Society, April 1994.
  194. Shashank Nemawarkar, Ramaswamy Govindarajan, Guang R. Gao, and Vinod K. Agarwal, Analysis of Multithreaded Multiprocessors with Distributed Shared Memory, Proceedings of the Fifth IEEE Symposium on Parallel and Distributed Processing, Pages: 114-121, Dallas, Texas, December 1993.
  195. Ramaswamy Govindarajan and Guang R. Gao, A Novel Framework for Multi-rate Scheduling in DSP Applications, Proceedings of the 1993 International Conference on Application Specific Array Processors, Pages: 77-88, Venice, Italy, IEEE Computer Society, October 1993.
  196. Guang R. Gao, Vivek Sarkar, and Lelia A. Vazquez, Beyond the Data Parallel Paradigm: Issues and Options, Proceedings - 1993 Programming Models for Massively Parallel Computers, Pages: 191-197, Berlin, Germany, IEEE Computer Society Press, September 20-23, 1993.
  197. Guang R. Gao, Qi Ning, and Vincent Van Dongen, Extending Software Pipelining Techniques for Scheduling Nested Loops, Proceedings of the 6th International Workshop on Languages and Compilers for Parallel Computing, number 768 in Lecture Notes in Computer Science, Pages: 340-357, Portland, Oregon, Springer-Verlag, August 1993.
  198. Erik R. Altman, Vinod K. Agarwal, and Guang R. Gao, A Novel Methodology Using Genetic Algorithms for the Design of Caches and Cache Replacement Policy, Proceedings of the 5th International Conference on Genetic Algorithms, Pages: 392-399. Morgan Kaufmann Publishers, Inc., University of Illinois at Urbana-Champaign, July 1993.
  199. Kevin B. Theobald, Guang R. Gao, and Laurie J. Hendren, Speculative Execution and Branch Prediction on Parallel Machines, Conference Proceedings, 1993 IEEE/ACM International Conference on Supercomputing, Pages: 77-86, Tokyo, Japan, July 1993.
  200. Robert K. Yates and Guang R. Gao, A Kahn Principle for Networks of Nonmonotonic Real-time Processes. Proceedings of PARLE '93 - Parallel Architectures and Languages Europe, number 694 in Lecture Notes in Computer Science, Pages: 209-227, Munich, Germany, Springer-Verlag, June 1993.
  201. Herbert H. J. Hum and Guang R. Gao, Supporting a Dynamic SPMD Model in a Multi-threaded Architecture, Digest of Papers, 38th IEEE Computer Society International Conference, COMPCON Spring '93, pp 165-174, San Francisco, California, February 1993.
  202. Qi Ning and Guang R. Gao, A Novel Framework of Register Allocation for Software Pipelining, Conference Record of the Twentieth Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, pp 29-42, Charleston, South Carolina, January 1993.
  203. Kevin B. Theobald, Guang R. Gao, and Laurie J. Hendren, On the Limits of Program Parallelism and its Smoothability, Proceedings of the 25th Annual IEEE/ACM International Symposium on Microarchitecture, Pages: 10-19, Portland, Oregon, December 1992.
  204. Vincent Van Dongen, Guang R. Gao, and Qi Ning, A Polynomial Time Method for Optimal Software Pipelining, Proceedings of the Conference on Vector and Parallel Processing, CONPAR-92, number 634 in Lecture Notes in Computer Science, Pages: 613-624, Lyon, France, Springer-Verlag, September 1-4, 1992.
  205. Jean Merc. Monti and Guang R. Gao, Efficient Interprocessor Synchronization and Communication on a Dataflow Multiprocessor Architecture, Proceedings of 1992 International Conference on Parallel Processing, Pages: I-220-224, St. Charles, IL, August 1992.
  206. Guang R. Gao, Russell Olsen, Vivek Sarkar, and R. Thekkath, Collective Loop Fusion for Array Contraction, Proceedings of the 5th International Workshop on Languages and Compilers for Parallel Computing, number 757 in Lecture Notes in Computer Science, Pages: 281-295, New Haven, Connecticut, Springer-Verlag, August 1992.



207. Laurie J. Hendren, Chris Donawa, Maryam Emami, Guang R. Gao, Justiani, Bhama Sridharan, Designing the McCAT Compiler Based on a Family of Structured Intermediate Representations, Proceedings of the 5th International Workshop on Languages and Compilers for Parallel Computing, number 757 in Lecture Notes in Computer Science, Pages: 406-420, New Haven, Connecticut, Springer-Verlag, August 1992.
208. Qi Ning, Guang R. Gao, Minimizing Loop Storage Allocation for An Argument-Fetching Dataflow Architecture Model, Proceedings of the 4th International PARLE Conference, Pages: 585-600, Paris, France, June 15-18, 1992.
209. Shashank S. Nemawarkar, Ramaswamy Govindarajan, Guang R. Gao, Vinod K. Agarwal, Performance Evaluation of Latency Tolerant Architectures, Proceedings of IEEE Fourth International Conference on Computing and Information (ICCI'92), Pages: 183-186, Toronto, Ontario, Canada, May 28-30, 1992.
210. L.J. Hendren, G.R. Gao, Designing programming languages for analyzability: a fresh look at pointer data structures, Proceedings of the 1992 International Conference on Computer Languages, Pages: 242-251, Oakland, CA, USA, April 20-23, 1992.
211. G.R. Gao, R. Govindarajan, P. Panangaden, Well-behaved dataflow programs for DSP computation, Proceedings of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP-92), Vol. 5, Pages: 561-564 March 23-26 1992.
212. H.H.J. Hum, G.R. Gao, Efficient support of concurrent threads in a hybrid dataflow/vonNeumann architecture, Proceedings of the Third IEEE Symposium on Parallel and Distributed Processing, Pages: 190-193, Dallas, TX, USA, Dec. 02-05 1991.
213. Kevin B. Theobald, Guang R. Gao, An efficient parallel algorithm for all pairs examination, Proceedings Supercomputing'91, Pages: 742-753, Albuquerque, NM, USA, November 18-22, 1991.
214. Guang R. Gao, Qi Ning, Loop Storage Optimization for Dataflow Machines, Proceedings of the Fourth International Workshop on Languages and Compilers for Parallel Computing (LCPC'1991), Pages: 359-373, Santa Clara, California, USA, August 7-9, 1991.
215. Vivek Sarkar, Guang R. Gao, Optimization of array accesses by collective loop transformations, Proceedings of the 5th International Conference on Supercomputing (ICS'1991), Pages: 194-205, Cologne, Germany, June 1991.
216. Guang R. Gao, Yue-Bong Wong, Qi Ning, A Timed Petri-Net Model for Fine-Grain Loop Scheduling, Proceedings of the ACM SIGPLAN'91 Conference on Programming Language Design and Implementation (PLDI), Pages: 204-218, Toronto, Ontario, Canada, June 26-28, 1991.
217. Herbert H. J. Hum, Guang R. Gao, A Novel High-Speed Memory Organization for Fine-Grain Multi-Thread Computing, Parallel Architectures and Languages Europe, Volume I: Parallel Architectures and Algorithms, Pages: 34-51, Eindhoven, The Netherlands, June 10-13, 1991.
218. Guang R. Gao, Herbert H. J. Hum, Jean-Marc Monti, Towards an Efficient Hybrid Dataflow Architecture Model, Parallel Architectures and Languages Europe, Volume I: Parallel Architectures and Algorithms, Pages: 355-371, Eindhoven, The Netherlands, June 10-13, 1991.
219. Gao, G.R. Yates, R.K. Dennis, J.B. Mullin, L.M.R., A strict monolithic array constructor, Proceedings of the Second IEEE Symposium on Parallel and Distributed Processing, Pages: 596-603, Dallas, TX, USA, Dec. 9-13 1990.
220. Guang R. Gao, Herbert H. J. Hum, Yue-Bong Wong, An Efficient Scheme for Fine-Grain Software Pipelining, Proceedings of Conference on Algorithms and Hardware for Parallel Processing (CONPAR'1990), Pages: 709-720, Zurich, Switzerland, September 10-13, 1990.
221. Guang R. Gao, Herbert H. J. Hum, Yue-Bong Wong, Towards efficient fine-grain software pipelining, Proceedings of the 4th International Conference on Supercomputing (ICS 1990), Pages: 369-379, Amsterdam, The Netherlands, June 11-15, 1990.
222. G.R. Gao, Z. Paraskevas, Dataflow software pipelining: a case study, Proceedings of Ninth Annual International Phoenix Conference on Computers and Communications, Page: 874, Scottsdale, AZ, USA, March 21-23 1990.
223. G.R. Gao, H.H.J. Hum, Y.-B. Wong, Parallel function invocation in a dynamic argument-fetching dataflow architecture, Proceedings of International Conference on Databases, Parallel Architectures and Their Applications (PARBASE-90), Pages: 112-116, Miami Beach, FL, USA, Mar. 7-9 1990.

224. G.R. Gao, R. Tio, Instruction set architecture of an efficient pipelined dataflow architecture, Proceedings of the Twenty-Second Annual Hawaii International Conference on System Sciences, 1989. Vol. I: Architecture Track, Pages: 385-392, Kailua-Kona, HI, USA, Jan. 03-06 1989.
225. Guang R. Gao, René Tio, Herbert H. J. Hum, Design of an Efficient Dataflow Architecture without Data Flow, Proceedings of the International Conference on Fifth Generation Computer Systems (FGCS'1988), Pages: 861-868, Tokyo, Japan, November 28-December 2, 1988.
226. Jack B. Dennis, Guang R. Gao, An efficient pipelined dataflow processor architecture, Proceedings of Supercomputing'88, Pages: 368-373, Orlando, FL, USA, November 12-17, 1988.
227. G. R. Gao and S. J. Thomas, An optimal parallel Jacobi-like solution method for the singular value decomposition, Proceedings of the International Conference on Parallel Processing, Pages: 47-53, University Park, PA, USA, August 10-14 1988.
228. Guang R. Gao, A Pipelined Solution Method of Tridiagonal Linear Equation Systems, Proceeding of International Conference on Parallel Processing (ICPP'86), Pages: 84-91, University Park, PA, USA, 1986.
229. Jack B. Dennis, Guang R. Gao, Maximum Pipelining of Array Operations on Static Data Flow Machine, Proceedings of International Conference on Parallel Processing (ICPP'83), Pages: 331-334, Columbus, Ohio, USA, 1983.

### C. Books / Book Chapters / Notes Sets

1. L.T.Yang, M. Guo, G. R. Gao, N. K. Jha, Proceedings of Embedded and Ubiquitous Computing, International Conference EUC 2004, Aizu-Wakamatsu City, Japan, August 25-27, 2004, Lecture Notes in Computer Science, Vol. 3207. Springer, 2004.
2. B. Kleinjohann, G. R. Gao, H. Kopetz, L. Kleinjohann and A. Rettberg, Design Methods and Applications for Distributed Embedded Systems, IFIP International Federation for Information Processing , Vol. 150. Springer 2004.
3. Hai Jin, Guang R. Gao, Zhiwei Xu, Hao Chen (Eds.), Proceedings of Network and Parallel Computing, IFIP International Conference, NPC 2004, Wuhan, China, October 18-20, 2004., Lecture Notes in Computer Science 3222. Springer, 2004.
4. Guang R. Gao, Ken Arnold and Sudipto Ghosh, Java/Jini Technologies and High-Performance Pervasive Computing, 30 July and 1 August 2002, Boston, USA.
5. Krishna Palem, Guang R. Gao, Trevor Mudge, Proceedings of the 2001 International Conference on Compilers, Architecture, and Synthesis for Embedded Systems, Atlanta, Georgia, USA, November 16 - 17, 2001.
6. Guang R. Gao, J-L. Gaudiot, and L. Bic, editors, Advanced Topics in Dataflow and Multithreaded Computers. IEEE Computer Society Press, 1995.
7. Michel Cosnard, Guang R. Gao, Gabriel M. Silberman, Parallel Architectures and Compilation Techniques: Proceedings of the IFIP WG10.3 Working Conference, PACT '94, Montreal, Canada, 24-26 August 1994.
8. Jack B. Dennis and Guang R. Gao, Multithreaded Architectures: Principles, Projects, and Issues, In Robert A. Iannucci, Guang R. Gao, Robert H. Halstead, Jr., and Burton Smith, editors, Multithreaded Computer Architecture: A Summary of the State of the Art, chapter 1, Pages: 1-72. Kluwer Academic Publishers, Norwell, Massachusetts, 1994.
9. Robert A. Iannucci, Guang R. Gao, Robert H. Halstead, Jr., and Burton Smith, editors, Multithreaded Computer Architecture: A Summary of the State of the Art. Kluwer Academic Publishers, Norwell, Massachusetts, 1994. Book contains papers presented at the Workshop on Multithreaded Computers, Albuquerque, New Mexico, November 1991.
10. Lenore M. R. Mullin, Michael J. Jenkins, Gaétan Hains, Robert Bernecky and Guang Gao, Arrays, Functional Languages, and Parallel Systems, Kluwer Academic Publishers, Boston, Massachusetts, December 1991.
11. Guang R. Gao, A Code Mapping Scheme for Dataflow Software Pipelining, Kluwer Academic Publishers, Boston, Massachusetts, December 1990.

### D. Patents

1. Title: Codeletset Representation, Manipulation, and Execution-Methods, System And Apparatus  
Rishi Khan, Daniel Orozco, Guang Gao, Kelly Livingston.  
Patent number: 2012067688  
Date of Patent: May 25 2012.
2. Title: Runspace method, system and apparatus  
Rishi Khan, Daniel Orozco, Guang R. Gao.  
Patent No. US 2011/0246823 A1  
Date of Patent: Oct. 6, 2011
3. Title: Task-Oriented Node-Centric Checkpointing (TONCC)  
Rishi Khan, Guang R. Gao, Apperson H. Jhonson  
Patent No. US 2011/0246823 A1  
Date of Patent: Oct. 6, 2011
4. Title: Systems and Methods for Logic Verification  
Guang R. Gao, Fei Chen  
Patent No. US 7.934.179 B2  
Date of Patent: April 26, 2011
5. Title: Methods and Products for Processing Loop Nests  
Hongbo Rong, Guang R. Gao, Alban Douillet, R. Govindarajan  
Patent No. US 7.631.305 B2  
Date of Patent: Dec. 8, 2009
6. Title: Data driven logic simulation chip and tool chain  
Fei Chen, Guang R. Gao  
Patent No. US 2009/0222252 A1  
Date of Patent: Sep 3, 2009
7. Title: Methods and Apparatus for emulation of logic circuits  
Hirofumi Sakane, Levent Yakay, Vishal Karma, Clement Leung, Guang R. Gao.  
Patent No. US 7.356.454 B2  
Date of Patent: April 8, 2008
8. Title: Method for Integrating Software Pipelining with Multithreading  
Guang R. Gao, with Hongbo Rong, Alban Douillet, R. Govindarajan  
Provisional Application No.: 60/507,043  
Filing Date: Sept. 29, 2003  
US patent application pending
9. Title: Method and Apparatus for Real-Time Multithreading  
Guang R. Gao and Kevin Theobald  
Patent No. US 2005/0188177 A1  
Date of Patent: Aug. 25, 2005
10. Title: Method And Apparatus For Iterative Emulation Of Large Logic Circuits Containing Multiple Identical Logic Modules  
Guang R. Gao, with Hirofumi Sakane, Levent Yakay, Vishal Karna, Clement Leung  
Provisional Application No.: 60/512,376  
Filed Date: November 17, 2003  
US patent application pending



### ***B.3: CONTRACTS AND GRANTS***

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#### **A. NSF Grants**

1. SHF: MEDIUM: Collaborative Research: Architecture, Programmability, and Performance of Large Scale Parallel Systems. 2011-2014. NSF CCF-1065448. In charge \$301,133
2. Collaborative Research: Programming Models and Storage System for High Performance Computation with Many-Core Processors. 2009-2012. NSF CCF-937907. In charge \$299,984
3. A High Throughput Massive I/O Storage Hierarchy for PETA-scale High-end Architectures. 2009. NSF CCF-930078. In charge 12,000
4. Advanced Software Technology for an Exascale Point Design Study. 2009-2011. NSF CCF-925863. In charge \$199,998.
5. Collaborative Research: PetaApps: Enabling Multiscale Modeling of Turbulent Clouds on Petascale Computers. 2009-2011. NSF OCI-904534. In charge 1,064,500
6. Collaborative Research: Programming Models, Compiles, and Runtimes for High-end Computing on Manycore Processors. 2008-2011. NSF CCF-833122. In charge \$400,000
7. CSR-AES: Optimizations for Optimistic Parallelization Systems. 2007-2008. NSF CNS-720531. In charge \$300,000
8. CRI: Planning a Research Compiler Infrastructure Based on Open64. 2007-2008. NSF CNS-708856. In charge \$50,000
9. Collaborative Research: CRI: IAD: Development of a Research Infrastructure for the Multithreaded Computing Community Using the Cray Eldorado Platform. 2007-2013. NSF CNS-708820. In charge 77,150.
10. A High Throughput Massive I/O Storage Hierarchy for PETA-scale High-end Architectures. 2007-2010. NSF CCF-702244. In charge \$311,999
11. Collaborative Research: A programmable, efficient and dynamic architecture and compilation Framework for Networking Applications. 2005-2006. NSF CCF-541002. In charge \$175,000.
12. CSR-AES: Dynamic Adaptive Multithreading: Continuous Compilation and Runtime Scheduling for High End Computing. 2005-2007. NSF CNS-509332. In charge \$749,999.
13. A novel approach of software pipelining of multidimensional loops. 2004-2007. NSF 429781. In charge \$122.350. Total \$300.000
14. A meta-genome level analysis of an extreme microbial symbiosis. 2002-2005. NSF 120648. In charge \$224.400. Total 1.501.886
15. Increasing parallel program performance with the LC Memory consistency model. 2001-2004. NSF CCR-0105540. In charge \$86.898. Total \$270.000
16. A framework for developing complex applications on high-end peta-flop-class machines. 2001-2004. NSF NGS-0103723. In charge \$521.174. Total \$1.100.000
17. Multithreading: A viable approach for single-chip architecture. 199-2002. NSF MIPS-0073527. In charge \$187.998. Total \$600.000
18. Configurable off-the-shelf multithreaded experimental testbed (COMET). 2000-2002. NSF 9986043. In charge \$79.791. Total \$79.791
19. CISE Postdoctoral Research Associate. 1999-2001 NSF 9901553. In charge \$60.672. Total \$60.672
20. Parallel and distributed computing: System and application development. 1997-2002. NSF CDA-9703088. In charge \$633.513. Total \$633.513
21. Crack Propagation on Teraflop Computers. NSF CISE-9726388. 1998-2000. In charge \$264.952. Total \$1.800.000
22. Compiling Irregular multithreaded architecture. NSF 9808522. 1998-2001. In charge \$100.000. Total 319.156
23. New Generation Multithreaded processor. NSF MIPS-9707125. 1997-2000. In charge \$187.417. Total \$400.000
24. A Framework of modulo Scheduling Based on Finite Automaton. NSF CCR-9711477. 1997-1999. In Charge \$139.263. Total \$139.263.

**B. Other Federal Grants.**

1. Runnemed: Ubiquitous High Performance Computing (UHPC). 2010-2014. DARPA/Intel. In charge \$995,984
2. A Robust Hybrid I/O Storage Hierarchy for Future High-End Computer Systems. 2007-2009. NSA. In charge \$571,906
3. Dynamic Adaptive Execution Model for High Productivity Computing. 2008-2010. LSU/NSA. In charge \$352,397
4. A dynamic Multithreaded Virtual Machine for High-End Computing: Architecture Model and Continuous Compilation. 2005-2006. NSA. In charge \$468,367.
5. Design and Implementation of Virtual Feel Guided Mechanism; High Performance Micro Sensor Circuit Design. 2005-2006. NASA. In charge \$25,000
6. A dynamic multithreaded virtual machine for high-end computing. 2005-2007. NSA. In charge \$944.302. Total \$944.302
7. Efficient architecture and compiler support for fine-grain multithreading. 2003-2005. NSA. In charge \$945.000. Total \$945.000
8. A programming model and software infrastructure. 2001-2003. NSA. In charge \$444.000. Total \$444.000
9. Computational genomics of complex adaptive integration. 2002-2005. NHI/NIGMS P20 GM67266-03. Total \$1.920.000
10. Center for programming models for scalable parallel computing. 2002-2005. DOE DE-FC02-01ER25503. In charge \$600.000. Total \$9.000.000.
11. Multi-Tera Scale Complex Adaptation. 2001-2005 DARPA #F30602-01-2-0578. Total \$1.548.000
12. Compiler Optimization. 2000-2002. DARPA/PAC/C. In charge \$134.344. Total \$9.000.000
13. Productive easy-to-use, reliable computing system. 2003-2006. DARPA/IBM. In charge \$ 540.000. Total \$53.000.000
14. Data Intensive Architecture (DIVA). 1999-2001. DARPA/AFSOR. In Charge \$366.500 Total \$12.000.000.
15. Hybrid Technology Multithreaded Architecture for Petaflops. 1997-2001. DARPA/NSA/NASA/NSF. In charge \$1.363.000 Total \$10.000.000

**C. Industry Grants/Gifts and state funding**

1. Cyclops Supercomputer System Software R&D Project. 2008-2009. ETI. In charge \$54,315
2. Emerging Multi-Core Chip Hardware and Software Project. 2006-2007. ETI. In charge \$60,000.
3. A Multi-Core Virtual Machine and IP Core. 2006. ETI. In charge \$27,000
4. Cyclops Supercomputer System Software R&D Project. 2004-2005. ETI. In charge 160,019
5. Industry contracts and gifts (Intel, SGI, Connexant, AstroZenica, ETI, Acorn, Dupont, etc). 1996-2005. In charge \$500.000
6. State funding. 1996-2005. DBI. In charge \$93.000 Total \$93.000

**Section C: Services**

***C.1: UNIVERSITY ACTIVITIES AND SERVICES***

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- Member, Undergraduate award Committee (2006 – ).
- Member, Faculty Strategic Planning Committee, ECE Dept. (2009 – ).
- Member, Faculty Recruit Committee (1998 – 2008).
- Chair, Secondary Appointment Committee, ECE Dept. (2006 – 2007).
- Member, Department recruiting committee (2004-2005).
- Member, Secondary Appointment Committee (2004-2005).

- Participating faculty retreat meeting (1998).
- Dean's ad hoc group for supercomputing (1998).
- Participant Engineering Outreach program.
- Advisor in the university Undergraduate Research Opportunity program.
- Chairing the departmental Committee on Promotion & Tenure (1998).
- College Election Committee (1998).
- Dean search committee.
- Graduate study and PhD exam revision committee (2001-2005).
- Ad Committee of Educational in Bioinformatics.
- DBI Scientific Committee.
- ICRSS committee (Instructional, Computing and Research Support Services Committee).

**Section D: News**

News of Prof. Gao and CAPSL are available on the web. Visit <http://www.capsl.udel.edu/news.shtml>