CGO 2003

2003 International Symposium on Code Generation and Optimization with Special Emphasis on Feedback-Directed and Runtime Optimization

Final Program

March 23-26, 2003
Hyatt at Fisherman's Wharf, San Francisco, California

ACM SIGMICRO
In cooperation with SIGPLAN

IEEE TC-uARCH

Corporate supporters: **IBM, Intel, Microsoft and Transmeta**

Sunday March 23, 2003

9:00am - 6:00pm **1st Workshop on Optimizations for DSP and Embedded Systems (ODES)**
Organized by Deepu Talla (TI) and Lizy John (U. Texas)
Location: Sheraton, Marina II (Continental breakfast at 8:30am)

9:00am - 12:00 Tutorial #1: **ORP - A Java/CLI platform for investigating JIT and GC technologies**,
by Weldon Washburn (Intel)
Location: Sheraton, Marina I (Continental breakfast at 8:30am)

9:00 - 12:00 Tutorial #2: **On the Run - Building Dynamic Program Modifiers for Optimization, Introspection and Security,** *by Saman Amarasinghe (MIT) and Evelyn Duesterwald (IBM)*
Location: Hilton, Sonoma Ballroom (Continental breakfast at 8:30am)

12:00 - 1:30 **LUNCH (on your own)**

1:00pm - 6:00pm **1st Workshop on Managed Run Time Workloads**
Organized by Carole Dulong (Intel) and Lizy John (U. Texas)
Location: Sheraton, Marina I

1:30 - 5:30 Tutorial #3: **Security through Languages and Compilers,** *by Andrew Myers (Cornell)*
Location: Hilton, Sonoma Ballroom

Monday March 24, 2003 (Hyatt at Fisherman's Wharf)

7:30 - 8:30 **Continental breakfast**

8:00 **Welcome and Introduction**

8:30 - 9:30 **Keynote**: *Fran Allen, IBM Fellow*

9:30 - 10:00 **BREAK**

10:00 - 12:00 Session 1: **Dynamic Translation** (Chair: S. Eggers, U. of Washington)

The Transmeta Code Morphing Software: Using Speculation, Recovery, and Adaptive Retranslation To Address Real-Life Challenges, James C. Dehnert, Brian K. Grant, John P. Banning, Richard Johnson, Thomas Kistler, Jim Mattson (Transmeta)

Dynamic Binary Translation For Accumulator-Oriented Architectures, Ho-Seop Kim, James E. Smith (University of Wisconsin, Madison)

Retargetable and Reconfigurable Software Dynamic Translation, K. Kevin Scott (U. Virginia), Naveen Kumar (U. Pittsburgh), Sivakumar Velusamy (U. Virginia), Bruce Childers (U. Pittsburgh), Jack Davidsor (U. Virginia), and Mary Lou Soffa (U. Pittsburgh)

Jumbo: Run-time Code Generation for Java and Its Applications, Sam Kamin, Lars Clausen, Ava Jarvis (University of Illinois, Urbana-Champaign)

12:00 - 1:30 **LUNCH (provided)**

1:30 - 3:30 Session 2: **Profile-Based Optimizations** (Chair: C. Dulong, Intel)

Reality-Based Optimization, Scott McFarling (Microsoft)

Coupling On-Line and Off-Line Profile Information to Improve Program Performance, Chandra Krintz (University of California, Santa Barbara)

Dynamic Trace Selection using Performance Monitoring Hardware Sampling, Howard Chen, Wei-Chung Hsu, Jiwei Lu, Pen-Chung Yew (University of Minnesota), Dong-Yuan Chen (Intel)

Optimal and Efficient Speculation-based Partial Redundancy Elimination, Qiong Cai, Jingling Xue (University of New South Wales)

3:30 - 4:00 **BREAK**

4:00 - 6:00 Session 3: **EPIC Compilation** (Chair: M. Smith, Harvard)

Optimizations to Prevent Cache Penalties for the Intel® Itanium® 2 Processor, Jean-Francois Collard, Daniel Lavery (Intel)

Optimization for the Intel® Itanium® Architecture Register Stack, Alex Settle, Dan Connors (University of Colorado, Boulder), Gerolf Hoflehner, Dan Lavery (Intel Corporation)

Speculative Register Promotion Using Advanced Load Address Table (ALAT), Jin Lin, Tong Chen, Wei-Chung Hsu and Pen-Chung Yew (University of Minnesota)

Inlining of Mathematical Functions in HP-UX for Itanium® 2, James W Thomas (Hewlett-Packard)

Tuesday March 25, 2003 (Hyatt at Fisherman's Wharf)

7:30 - 8:30 *Continental breakfast*

8:30 - 10:30 Session 4: **Code Scheduling** (Chair: K. Ebcioglu)

Improving Quasi-Dynamic Schedules Through Region Slip, Francesco Spadini, Brian Fahs, Sanjay Patel, and Steve Lumetta (University of Illinois, Urbana-Champaign)

Integrated Prepass Scheduling for a Java Just-In-Time Compiler on the IA-64 Architecture, Tatsushi Inagaki, Hideaki Komatsu, Toshio Nakatani (IBM)

Predicate-Aware Scheduling: A Technique for Reducing Resource Constraints, Mikhail Smelyanskiy, Scott A. Mahlke, Edward S. Davidson (University of Michigan), Hsien-Hsin S. Lee (Georgia Institute of Technology)

Phi Predication for Light-Weight If-Conversion, Weihaw Chuang, Brad Calder, and Jeanne Ferrante (University of California, San Diego)

10:30 - 11:00 *BREAK*

11:00 - 12:00 Session 5: **Code Optimization – I** (Chair: J.-D. Choi, IBM)

Local Scheduling Techniques for Memory Coherence in a Clustered VLIW Processor with a Distributed Data Cache Code, Enric Gibert (UPC Barcelona), Jesús Sánchez (Intel), Antonio González (UPC Barcelona and Intel)

Compiler Optimization-Space Exploration, Spyridon Triantafyllis, Manish Vachharajani, Neil Vachharajani, David August (Princeton University)

12:00 - 1:30 *LUNCH (on your own)*

1:30 - 2:30 Session 6: **Code Optimization – II** (Chair: B. Zorn, Microsoft)

Optimizing Memory Accesses for Spatial Computation, Mihai Budiu, Seth Copen Goldstein (Carnegie Mellon University)

Optimization Opportunities Created by Global Data Reordering, Gadi Haber, Moshe Klausner, Vadim Eisenberg, Bilha Mendelson, Maxim Gurevich (IBM)

2:30 - 3:00 *BREAK*

3:00 - 4:00 *Invited Lecture*: Greg Papadopoulos, CTO, SUN Microsystems

4:00 - 6:00 Session 7: **Dynamic Adaptive Compilation** (Chair: E. Duesterwald, IBM)

Design, Implementation, and Evaluation of Adaptive Recompilation with On-Stack Replacement, Stephen Fink, Feng Qian (IBM)

Adaptive Online Context-Sensitive Inlining, Kim Hazelwood (Harvard University), David Grove (IBM)

An Infrastructure for Adaptive Dynamic Optimization, Derek Bruening, Timothy Garnett, Saman Amarasinghe (MIT)

Dynamic Profiling and Trace Cache Generation, Marc Berndl, Laurie Hendren (McGill University)

6:30 - **MICROSOFT BANQUET DINNER**

9:30 PM - **CGO Open Business Meeting**

Wednesday March 26, 2003 (Hyatt at Fisherman's Wharf)

8:30 - 9:30 *Continental Breakfast*

9:30 - 10:30 Session 8: **Performance Monitoring** (Chair: CJ Newburn, Intel)

METRIC: Tracking Down Inefficiencies in the Memory Hierarchy via Binary Rewriting, Jaydeep Marathe, Frank Mueller (North Carolina State University), Tushar Mohan (University of Utah), Sally A. McKee (Cornell University), Bronis R. de Supinski, Andy Yoo (Lawrence Livermore National Laboratory)

TEST: A Tracer for Extracting Speculative Threads, Michael Chen, Kunle Olukotun (Stanford University)

10:30-11:00 *BREAK*

11:00 - 12:30 Session 9: **Code Optimization III** (Chair: S. Mahlke, U. of Michigan)

Optimization for Code Compression, Milenko Drinic (Computer Science Department, UCLA), Darko Kirovski and Hoi Vo (Microsoft Research).

Hiding Program Slices for Software Security, Xiangyu Zhang, Rajiv Gupta (University of Arizona, Tucson)

Addressing Mode Selection, Erik Eckstein (ATAIR Software), Bernhard Scholz, (Vienna University of Technology)

12:30 *Concluding Remarks*