POPL® '96

Advance Program

The 23rd Annual
ACM SIGACT–SIGPLAN
Symposium on

Principles of Programming Languages®

St. Petersburg Beach, Florida
21–24 January 1996

Sponsored by ACM SIGPLAN and SIGACT

Information and documents concerning the POPL '96 conference and workshops are available in electronic form by

(FTP) *ftp*://parcftp.xerox.com/pub/popl96/

(WWW) *ftp*://parcftp.xerox.com/pub/popl96/popl96.html

Sunday, 21 January 1996

A full day of activities has been arranged to precede the main conference. A workshop will extend through most of the day. Concurrently there will be a tutorial in the afternoon. Due to the relatively large number of sequentially presented papers, there will be only one invited lecture, and it will be presented Sunday evening. As always, the invited lecture is free to conference attendees; however, fees are required to attend the workshop or the tutorial.

9:00–17:00 *Workshop*

20th Anniversary Scheme Workshop

The Scheme programming language was born twenty years ago in the programming languages research of Gerald Sussman and Guy Steele. It has flourished in the programming languages research and computer science education communities, has become an IEEE and ANSI standard, and has recently enjoyed growing acceptance in industry.

Gerald Sussman will deliver a keynote address entitled "Procedural epistemology". The remainder of the program will consist of invited talks and panel discussions that emphasize historical perspective, future directions, and pedagogical possibilities of Scheme. Please see *http://www.cs.indiana.edu/psw/* for details.

Workshop Program Committee

Chair: Chris Haynes (*Indiana University*)
`chaynes@cs.indiana.edu`

Members: Suresh Jaganathan (*NEC Research Laboratories*)
John Ramsdell (*Mitre Corporation*)
Carolyn Talcott (*Stanford University*)

13:00–17:00 *Tutorial* Chair: **Hans-J. Boehm**

Code Optimization in Modern Compilers
by
Krishna V. Palem (Courant Institute of Mathematical Sciences, NYU) and Vivek Sarkar (IBM Santa Teresa Laboratory)

The primary goal of this tutorial is to provide an overview of state-of-the-art code optimization techniques used in compilers for modern processors. The performance gap between optimized and unoptimized code continues to widen as modern processors have evolved to include hardware features such as superscalar and pipelined functional units, and sophisticated memory hierarchies. Compile-time code optimization is critical to automatically harnessing the high performance offered by modern processors.

The tutorial is self-contained and begins with an overview of the design of optimizing compilers. Selected state-of-the-art optimizations such as instruction scheduling, register allocation and optimizations for memory hierarchies are then discussed in detail, using a quantitative framework to explain the key principles. Issues related to interactions among individual optimizations are also discussed. The optimizations covered in this tutorial are most relevant for RISC processors, and third-generation programming languages such as C and Fortran.

19:30–20:30 *Invited Lecture* Chair: **Vijay Saraswat**

Java: Why we did the things we did
by
James Gosling (Sun Microsystems, Inc.)

Conference Program

Monday, 22 January 1996

9:00–10:30 Chair: **Daniel Weise**

Is it a Tree, a DAG, or a Cyclic Graph? A Shape Analysis for Heap-Directed Pointers in C. (Rakesh Ghiya and Laurie J. Hendren) (McGill University)

Solving Shape-Analysis Problems in Languages with Destructive Updating. (Mooly Sagiv and Thomas Reps) (University of Wisconsin) and Reinhard Wilhelm (Universität des Saarlandes)

Points-to Analysis in Almost Linear Time. Bjarne Steensgaard (Microsoft Research)

11:00–12:30 Chair: **Zhong Shao**

What Are Principal Typings and What Are They Good For?. Trevor Jim (Massachusetts Institute of Technology)

Putting Type Annotations to Work. Martin Odersky (University of Karlsruhe) and Konstantin Läufer (Loyola University Chicago)

Using Parameterized Signatures to Express Modular Structure. Mark P. Jones (University of Nottingham)

14:00–16:00 Chair: **Edward Wimmers**

Faster Checking of Software Specifications by Eliminating Isomorphs. (Daniel Jackson, Somesh Jha, and Craig A. Damon) (Carnegie Mellon University)

Optimization and Relaxation in Constraint Logic Languages. (Kannan Govindarajan and Bharat Jayaraman) (SUNY at Buffalo) and Surya Mantha (Xerox Corporation)

Pure versus Impure LISP. Nicholas Pippenger (University of British Columbia)

On the Complexity of Beta-Reduction. Andrea Asperti (Universita Degli Studi Di Bologna)

16:30–18:00 Chair: **Benjamin Zorn**

Filter Fusion. (Todd Proebsting and Scott A. Watterson) (University of Arizona)

'C: A Language for High-Level, Efficient, and Machine-Independent Dynamic Code Generation. (Dawson R. Engler, Wilson C. Hsieh, and M. Frans Kaashoek) (Massachusetts Institute of Technology)

A General Approach for Run-Time Specialization and its Application to C. (Charles Consel and François Noël) (University of Rennes)

Reception

Tuesday, 23 January 1996

8:30–10:30 Chair: **Hanne Riis Nielson**

Discovering Auxiliary Information for Incremental Computation. (Yanhong A. Liu, Scott D. Stoller, and Tim Teitelbaum) (Cornell University)

From Region Inference to von Neumann Machines via Region Representation Inference. Lars Birkedal (Carnegie Mellon University), Mads Tofte (University of Copenhagen), and Magnus Vejlstrup (NKT Elektronik)

A Practical and Flexible Flow Analysis for Higher-Order Languages. J. Michael Ashley (Indiana University)

Trace-Based Program Analysis. (Christopher Colby and Peter Lee) (Carnegie Mellon University)

11:00–12:30 Chair: **Preston Briggs**

Iterated Register Coalescing. Lal George (AT&T Bell Labs) and Andrew W. Appel (Princeton University)

Generating Machine Specific Optimizing Compilers. (Roger Hoover and Kenneth Zadeck) (IBM T. J. Watson Research Center)

Minimum Cost Interprocedural Register Allocation. (Steven M. Kurlander and Charles N. Fischer) (University of Wisconsin—Madison)

14:00–16:00 Chair: **Philip Wadler**

Type-Directed Partial Evaluation. Olivier Danvy (Aarhus University)

A Modal Analysis of Staged Computation. (Rowan Davies and Frank Pfenning) (Carnegie Mellon University)

Typed Closure Conversion. Yasuhiko Minamide (Kyoto University) and (Greg Morrisett and Robert Harper) (Carnegie Mellon University)

Revisiting Catamorphisms over Datatypes with Embedded Functions (or, Programs from Outer Space). (Leonidas Fegaras and Tim Sheard) (Oregon Graduate Institute of Science & Technology)

16:30–18:00 Chair: **Steven Lucco**

Concurrent Haskell. Simon Peyton Jones (University of Glasgow), Andrew Gordon (University of Cambridge), and Sigbjorn Finne (University of Glasgow)

A Provably Time-Efficient Parallel Implementation of Full Speculation. (John Greiner and Guy E. Blelloch) (Carnegie Mellon University)

Static Analysis to Reduce Synchronization Costs in Data-Parallel Programs. (Manish Gupta and Edith Schonberg) (IBM T. J. Watson Research Center)

Wednesday, 24 January 1996

8:30–10:30 Chair: **Vijay Saraswat**

Functional Computation as Concurrent Computation. Joachim Niehren (German Research Center for Artificial Intelligence (DFKI))

Composing Processes. Kohei Honda (University of Manchester)

Linearity and the Pi-Calculus. Naoki Kobayashi (University of Tokyo), Benjamin C. Pierce (University of Cambridge), and David N. Turner (University of Glasgow)

The Reflexive CHAM and the Join-Calculus. (Cédric Fournet and Georges Gonthier) (INRIA Rocquencourt)

11:00–12:30 Chair: **Robert Cartwright**

Bisimilarity for a First-Order Calculus of Objects with Subtyping. (Andrew D. Gordon and Gareth D. Rees) (University of Cambridge)

An Interpretation of Objects and Object Types. (Martín Abadi and Luca Cardelli) (Digital Systems Research Center) and Ramesh Viswanathan (Isaac Newton Institute for Mathematical Sciences)

Proving the Correctness of Reactive Systems Using Sized Types. (John Hughes, Lars Pareto, and Amr Sabry) (Chalmers University)

St. Petersburg

Located on the Gulf of Mexico, St. Petersburg and the Bay Area averages 361 sunny days per year. The average day temperature in January is 70.8°F (21.5°C) while the average nighttime temperature is 54.6°F (12.5°C).

Local area attractions include Busch Gardens, Lowry Park Zoo, The Pier, Adventure Island, and The Florida Aquarium.

The TradeWinds, a four-diamond beach resort located on an island 7 miles long and 1/4 mile wide, spans 18 lush acres dotted with meandering waterways, charming white foot bridges and Victorian gazebos.

Hotel Reservations

Mention "Association for Computing Machinery" to receive the POPL rates, valid if you register by **21 December 1995**.

By Mail	**By Phone**
Tradewinds Resort:	(800) 345–6461
5500 Gulf Boulevard	+1 (813) 367–6464
St. Petersburg Beach, FL 33706	Fax: +1 (813) 367–4567

Single or double occupancy rate: \$110.00 per night (+11% state tax)
Suite (if available; please call hotel): \$150.00 per night (+11% state tax)

Name(s): ____

Affiliation: ____

Address: ____
street

____
city state zip country

Phones: ____
voice fax

____
arrival date number of nights # rooms # people

Special Needs: ____

Guarantee room by credit card? ☐ Visa ☐ MasterCard
☐ American Express ☐ Diners Club ☐ Discover
☐ Carte Blanche

Credit card: ____
number expiration date

Signature:

(cut here)

Transportation

Airport transfers are available from both Tampa International and St. Petersburg/Clearwater Airports directly to the resort through THE LIMO, INC. Tradewinds also features an on-site Avis Rent-A-Car office.

AVIS: +1 (813) 360-2127

THE LIMO, INC.: (813) 572-1111.

Driving Directions from Tampa International Airport: Take the lane to I-275 South, "to St. Petersburg". Exit I-275 South at the Pinellas Bayway (Exit 4) to St. Petersburg Beach. Turn Right on Gulf Boulevard, and Tradewinds is on the left about 1.5 miles north.

Conference Registration Form

Name: ____
title first last

Name tag should read: ____

Affiliation: ____

Address: ____
street

____
city state zip country

Phones: ____
voice fax

Electronic mail: ____

The list of attendees will be sent electronically, only to attendees.
May we include you on this list? ☐ yes ☐ no
Dietary preference? ☐ Vegetarian (may contain dairy, eggs)
☐ Vegan (no animal products) ☐ Kosher

Special needs or accommodations: ____

Conference registration includes the proceedings, reception (except for student registration), 3 continental breakfasts, 2 lunches, and coffee breaks.
Scheme workshop registration includes continental breakfast on Sunday, lunch, and coffee breaks.
Tutorial registration includes one coffee break.
Registration for any paid event includes the invited lecture.

	Conference Early	Conference Late	Workshop	Tutorial Early	Tutorial Late
			(Pick at most one		)
ACM and (SIGACT or SIGPLAN)	☐ 300	☐ 350	☐ 60	☐ 50	☐ 65
ACM or SIGACT or SIGPLAN	☐ 325	☐ 375	☐ 70	☐ 60	☐ 75
Non-Member	☐ 350	☐ 425	☐ 80	☐ 75	☐ 90
Full-Time Student	☐ 125	☐ 150	☐ 50	☐ 35	☐ 50

Total (Conference, workshop, tutorial): ____

☐ check (US$, payable to POPL '96) ☐ Visa ☐ MasterCard ☐ American Express

Credit card: ____
number expiration date

Signature: ____

The deadline for early registration is 16 December 1995. Electronic registration by e-mail is acceptable, but fax registration is preferred.

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Registration Systems Lab	Fax: +1 (407) 628–3186
2060 Goldwater Court	E-mail: mann@cs.ucf.edu
Maitland, FL 32751 USA	

Signature of e-mail registrants will be required at the conference; refund requests must be submitted in writing by mail or fax.