2007
Volume 29, Number 6

ACM Transactions on

Programming Languages and Systems

Article 30 (2 pages)	**K. S. McKinley** **K. Pingali**	Editorial: A Changing of the Guard 2006 Reviewers
Article 31 (100 pages)	**K. Honda** **N. Yoshida**	A Uniform Type Structure for Secure Information Flow
Article 32 (41 pages)	**C. Grothoff** **J. Palsberg** **J. Vitek**	Encapsulating Objects with Confined Types
Article 33 (29 pages)	**T. A. Henzinger** **C. M. Kirsch**	The Embedded Machine: Predictable, Portable Real-Time Code
Article 34 (45 pages)	**W. Thies** **F. Vivien** **S. Amarasinghe**	A Step Towards Unifying Schedule and Storage Optimization
Article 35 (67 pages)	**C. S. Collberg** **C. Thomborson** **G. M. Townsend**	Dynamic Graph-Based Software Fingerprinting
Article 36 (35 pages)	**A. Ohori**	A Proof Theory for Machine Code

continued on back cover

Association for Computing Machinery

Advancing Computing as a Science & Profession

ACM Transactions on Programming Languages and Systems

Vol. 29 • No. 6 • 2007

Articles 30-39

Article 37 (36 pages) — **K. Casey, M. A. Ertl, D. Gregg** — Optimizing Indirect Branch Prediction Accuracy in Virtual Machine Interpreters

Article 38 (13 pages) — **B. Karkare, U. P. Khedker** — An Improved Bound for Call Strings Based Interprocedural Analysis of Bit Vector Frameworks

Article 39 (39 pages) — **S. Seo, H. Yang, K. Yi, T. Han** — Goal-Directed Weakening of Abstract Interpretation Results

ACM Transactions on Programming Languages and Systems

ACM
2 Penn Plaza, Suite 701
New York, NY 10121-0701
Tel.: 212-869-7440
Fax: 212-869-0481
http://www.acm.org

Home Page: http://www.acm.org/toplas

Editors-in-Chief

Kathryn S. McKinley — Department of Computer Sciences / University of Texas at Austin / One University Station #C0500 / Austin, TX 78712-0233 / email: mckinley@cs.utexas.edu

Keshav Pingali — Institute for Computational Engineering and Sciences / University of Texas at Austin / One University Station #C0200 / Austin, TX 78712-0233 / email: pingali@cs.texas.edu

Editorial Assistant

Aubrey Hooser — Institute for Computational Engineering and Sciences / University of Texas at Austin / One University Station #C0200 / Austin, TX 78712-0233 / aubrey@cs.utexas.edu

Associate Editors

Martin Abadi — Computer Science Department / University of California at Santa Cruz / Baskin Engineering Building / Santa Cruz, CA 95064 / email: abadi@cs.ucsc.edu

Vikram Adve — Department of Computer Science MC-258 / University of Illinois at Urbana-Champaign / 3107 DCL / 1304 West Springfield Avenue / Urbana, IL 61801 / email: vadve@cs.uiuc.edu

Emery Berger — Department of Computer Science / University of Massachusetts–Amherst / Amherst, MA 01003 / email: emery@cs.umass.edu

Michael Burke — T. J. Watson Research Center (Hawthorne) / IBM / PO Box 704 / Yorktown Heights, NY 10598 / email: mgburke@us.umass.edu

Joxan Jaffar — School of Computing / National University of Singapore / 3 Science Drive 2 / Republic of Singapore 117543 / email: joxan@comp.nus.edu.sg

Wei Li — Intel Corporation / SC12-305 / 2200 Mission College Boulevard / Santa Clara, CA 95054 / email: wei.li@intel.com

Hanne Riis Nielson — Informatics and Mathematical Modelling / Technical University of Denmark / DTU-Building 321 / DK-2800 Lyngby, Denmark / email: riis@imm.dtu.dk

David Padua — Siebel Center for Computer Science / University of Illinois at Urbana-Champaign / 201 N. Goodwin Avenue / Urbana, IL 61801-2302 / email: padua@cs.uiuc.edu

Jens Palsberg — Computer Science Department / University of California, Los Angeles / 4531K Boelter Hall / Los Angeles, CA 90095-1596 / email: palsberg@ucla.edu

Simon Peyton Jones — Microsoft / 7 JJ Thomson Avenue / Cambridge CB3 0FB, England / email: simonpj@microsoft.com

Andreas Podelski — Department of Computer Science / Universität Freiburg / Lehrstuhl Softwaretechnik / Georges-Köhler-Allee 52 / D-79110 Freiburg, Germany / email: podelski@informatik.uni-freiburg.de

François Pottier — Gallium Team / INRIA / Domaine de Voluceau / Rocquencourt / 78153 Le Chesnay Cedex, France / email: fpottier@pauillac.inria.fr

Martin Rinard — Computer Science and Artificial Intelligence Laboratory / Massachusetts Institute of Technology / The Stata Center, Building 32-G744 / 32 Vassar Street / Cambridge, MA 02139 / rinard@csail.mit.edu

Aaron Stump — CSE Department / Washington University in St. Louis / One Brookings Drive / St. Louis, MO 63130 / email: stump@cse.wustl.edu

David Walker — Department of Computer Science / Princeton University / 35 Olden Street / Princeton, NJ 08540 / email: dpw@cs.princeton.edu

Headquarters Journals Staff

Mark Mandelbaum — Director of Publications
Jono Hardjowirogo — Publisher, Associate Director of Publications
Roma Simon — Managing Editor
Irma Strolia — Editorial Assistant
Media Content Marketing — Production

The ACM Transactions on Programming Languages and Systems (ISSN: 0164-0925) is published bimonthly by the Association for Computing Machinery (ACM), 2 Penn Plaza, Suite 701, New York, NY 10121-0701. Periodicals class postage paid at New York, NY 10001, and at additional mailing offices. Printed in the U.S.A. POSTMASTER: Send address changes to *ACM Transactions on Programming Languages and Systems*, ACM, 2 Penn Plaza, Suite 701, New York, NY 10121-0701.

For manuscript submissions, subscription, and change of address information, see inside backcover.

Copyright © 2007 by the Association for Computing Machinery (ACM). Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, requires prior specific permission and/or a fee. Request permission to republish from: Publications Department, ACM, Inc. Fax +1 212-869-0481 or email permissions@acm.org.

For other copying of articles that carry a code at the bottom of the first or last page or screen display, copying is permitted provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

Association for Computing Machinery

Advancing Computing as a Science & Profession

ACM Transactions on Programming Languages and Systems
http://www.acm.org/toplas

Process for Manuscript Submission. Submission of a manuscript to TOPLAS is a representation that the paper has neither been published nor submitted for publication elsewhere. Submission is also a representation that the work has been approved for open publication if performed under an official sponsorship requiring such an approval. The preferred method of submission is electronic. Electronic submissions should be sent to the editor-in-chief. To submit a paper electronically, send a postscript file containing the paper and a separate ASCII file containing: authors' names and addresses, including electronic addresses; identification of the corresponding author; title; abstract; and CR categories and subject descriptions and general terms and keywords.

The above information should also be included in the paper itself. The postscript file should be formatted for U.S.-sized 8.5 by 11" paper. It should not be encoded in any way, including MIME encoding. If authors are unable to submit the paper electronically, send five single-sided copies of the paper to the Editor-in-Chief along with a cover letter signed by the author. Papers will be refereed in the manner customary for scientific journals before being accepted for publication. Authors of an accepted paper will be asked to provide an electronic version of their paper. To simplify this process authors are strongly advised to consult ACM's guidelines for electronically submitting accepted articles prior to submission. Authors should keep editors informed of changes of address.

Correspondence regarding editorial matters should be addressed to Roma Simon, Managing Editor, 2 Penn, Suite 701, New York, NY 10121-0701, simon@acm.org.

Subscription, Single Copy, and Membership Information.

Send orders to:

ACM
P.O. Box 12114
Church Street Station
New York, NY 10257

For information, contact:

Mail: ACM Member Services Dept.
2 Penn Plaza, Suite 701
New York, NY 10121-0701
Phone: +1-212-626-0500
Fax: +1-212-944-1318
Email: acmhelp@acm.org
Catalog: http://www.acm.org/catalog

Subscription rates for *ACM Transactions on Programming Languages and Systems* are $43 per year for ACM members, $38 for students, and $150 for nonmembers. Single copies are $18 each for ACM members and $40 for nonmembers. Your subscription expiration date is coded in four digits at the top of your mailing label; the first two digits show the year, the last two show the month of expiration.

Notice to Past Authors of ACM-Published Articles. ACM intends to create a complete electronic archive of all articles and/or other materials previously published by ACM. If you have written a work that was previously published by ACM in any journal or conference proceedings prior to 1978, or any SIG Newsletter at any time, and you do NOT want this work to appear in the ACM Digital Library, please inform permission@acm.org, stating the title of the work, the author(s), and where and when published.

Microfilm and Microfiche. Microfilm and microfiche editions are also available from University Microfilms International, 300 North Zeeb Road, Department PR, Ann Arbor, MI 48106.

About ACM. ACM, the Association for Computing Machinery, is an international scientific and educational organization dedicated to advancing the art, science, engineering, and application of information technology, serving both the professional and public interests by fostering the open interchange of information and by promoting the highest professional and ethical standards. In addition to *ACM Transactions on Programming Languages and Systems*, ACM publishes numerous other refereed journals, magazines, newsletters, conference proceedings.

Visit ACM's Web site: http://www.acm.org.

Change of Address Notification. To notify ACM of a change of address, use the addresses above or send an email to coa@acm.org.

Please allow 6-8 weeks for new membership or change of name and address to become effective. Send your old label with your new address notification. To avoid interruption of service, notify your local post office before change of residence. For a fee, the post office will forward 2nd- and 3rd-class periodicals.