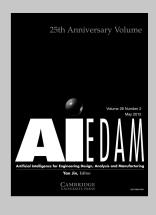
JOURNALS

AI EDAM

Editor

David C. Brown, Worcester Polytechnic Institute, USA

AI EDAM is a journal for engineers and designers who see AI technologies as powerful means for solving difficult engineering problems; and for researchers in AI and computer science who are interested in applications of AI and in the theoretical issues that arise from such applications. The journal publishes original articles about significant theory and applications based on the most up-to-date research in all branches and phases of engineering. Suitable topics include: analysis and evaluation; selection; configuration and design; manufacturing and assembly; and concurrent engineering.



AI EDAM

is available online at: http://journals.cambridge.org/aie

To subscribe contact Customer Services

in Cambridge:

Phone +44 (0)1223 326070 Fax +44 (0)1223 325150 Email journals@cambridge.org

in New York:

Phone +1 (845) 353 7500 Fax +1 (845) 353 4141 Email subscriptions_newyork@cambridge.org

Free email alerts

Keep up-to-date with new material – sign up at journals.cambridge.org/register

For free online content visit: http://journals.cambridge.org/aie



INSTRUCTIONS TO AUTHORS

Scope

Papers may describe original technical work, survey an area, or present a tutorial; and may be either short or long. Anything related to functional programming is of interest, including: *foundations* (semantics, abstract interpretation, lambda calculi, rewriting, logic, type theory, category theory); *implementation* (compilation, architectures, parallelism, garbage collection, I/O, debugging, profiling); *linguistics* (pure and impure language features, non-determinism, side effects, logical variables, relation to other programming paradigms, proofs about programs, program transformation, program synthesis, partial evaluation); *applications* (applications programs, practical experience, programming techniques, prototyping).

Book Reviews

Books for review, or suggestions for reviews, should be sent to the reviews editor, Simon Thompson (address on inside front cover).

Submission of manuscripts

Papers may be submitted to the Editors-in-Chief or any of the editors or directly to JFP-ed@cambridge.org. Please choose an Editor whose research interests most closely match your paper; if in doubt, send your paper to one of the Editors-in-Chief. E-mail and postal addresses for the editors appear on the inside front cover.

Please refer to journals.cambridge.org/JFP for all detailed information associated with the submission of papers to the journal.

Offprints

No paper offprints are provided, but a pdf of the published article will be sent to the corresponding author.

Incremental Publishing and DOIs

The Journal of Functional Programming now publishes articles as First View (at Cambridge Journals Online: journals.cambridge.org) as soon as author corrections have been completed and before they join a printed issue. A reference is added to the first page of the article in the journal catchline. This is the DOI—the Digital Object Identifier. This is a global publishers' standard. A unique DOI number is created for each published item. It can be used for citation purposes instead of volume, issue and page numbers. It therefore suits the early citation of articles which are published on the web before they have appeared in a printed issue. journals.cambridge.org/JFP

SUBSCRIPTIONS

Journal of Functional Programming (ISSN: 0956-7968 print, 1469-7653 electronic) is published in six parts in 2013, January, March, May, July, September and November. The subscription price (excluding VAT) of Volume 23, 2013, is £427 net (USA, Canada and Mexico US\$691) institutions print and electronic; institutions electronic only is £353, \$551; individuals print only is £120, \$186; Member rates available – please enquire; single parts cost £80 net (USA, Canada and Mexico US\$130) plus postage. EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Orders, which must be accompanied by payment, may be sent to any bookseller, subscription agent or to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, or in the USA, Canada and Mexico to Cambridge University Press, Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, New York 10994–2133. Prices include delivery by air where appropriate. Application to mail at periodicals postage rates is paid at New York, NY and at additional mailing offices. Japanese prices for institutions are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan. Postmaster: send address changes in USA, Canada and Mexico to Journal of Functional Programming, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994–2133. Claims for missing issues should be made immediately on receipt of the subsequent issue.

COPYING

This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA. 01923, USA. Organisations in the USA who are also registered with the C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. of the per-copy fee of \$16. This consent does not extend to multiple copying for promotional or commercial purposes. Code 0956-7968/13 \$16.

Organisations authorised by the Copyright Licensing Agency may also copy material subject to the usual conditions. *ISI Tear Service*, 3501 Market Street, Philadelphia, Pennsylvania 19104, USA, is authorised to supply single copies of separate articles for private use only.

For all other use, permission should be sought from Cambridge or the American branch of Cambridge University Press.

JOURNAL OF Functional Programming

VOLUME 23 PART 2 MARCH 2013

CONTENTS

FUNCTIONAL PEARLS Solving the snake cube puzzle in Haskell	
MARK P. JONES	145
Metamorphism in jigsaw KEISUKE NAKANO	161
An in-situ algorithm for expanding a graph RICHARD S. BIRD	174
Article EditorArrow: An arrow-based model for editor-based programming PETER ACHTEN, MARKO VAN EEKELEN, MAARTEN DE MOL	
AND RINUS PLASMEIJER	185
Book reviews	225

Cambridge Journals Online

For further information about this journal please go to the journal website at: journals.cambridge.org/jfp



MIX
Paper from
responsible sources
FSC® C018575

CAMBRIDGE UNIVERSITY PRESS