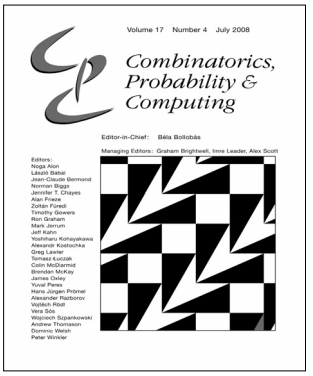
CAMBRIDGE JOURNALS



Combinatorics, Probability & Computing

Combinatorics, Probability and Computing: is available online at:
http://journals.cambridge.org/cpc

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

Editor
Béla Bollobás, DPMMS, Cambridge, UK; University of Memphis, USA

Published bi-monthly, *Combinatorics, Probability & Computing* is devoted to the three areas of combinatorics, probability theory and theoretical computer science. Topics covered include classical and algebraic graph theory, probabilistic methods and random combinatorial structures, the theory of algorithms, computational learning theory and optimisation.

Pricing information is available at:
http://journals.cambridge.org/cpc

Free email alerts
Keep up-to-date with new material – sign up at
http://journals.cambridge.org/alerts

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

CAMBRIDGE UNIVERSITY PRESS

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

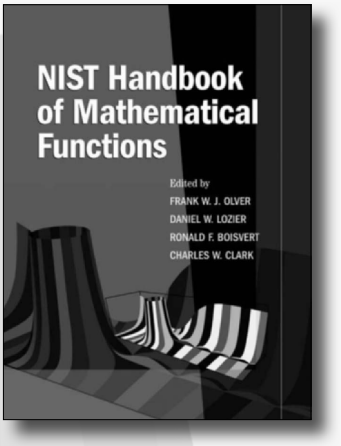
CAMBRIDGE

Noteworthy Titles from Cambridge!

NIST Handbook of Mathematical Functions

Companion to the Digital Library of Mathematical Functions

EDITED BY FRANK W. J. OLVER, DANIEL W. LOZIER, RONALD F. BOISVERT, AND CHARLES W. CLARK



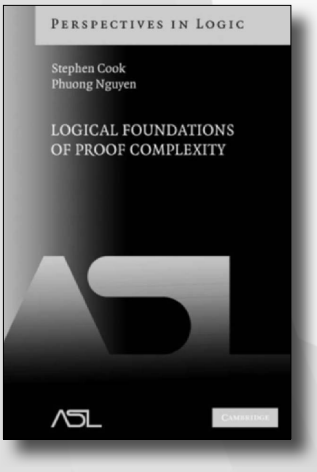
Modern developments in theoretical and applied science depend on knowledge of the properties of mathematical functions, from elementary trigonometric functions to the multitude of special functions. These functions appear whenever natural phenomena are studied, engineering problems are formulated, and numerical simulations are performed. They also crop up in statistics, financial models, and economic analysis. Using them effectively requires practitioners to have ready access to a reliable collection of their properties.

This handbook results from a 10-year project conducted by the National Institute of Standards and Technology with an international group of expert authors and validators. It is destined to replace its predecessor, the classic but long-outdated *NBS Handbook of Mathematical Functions,* edited by Abramowitz and Stegun.

$99.00: Hardback: 978-0-521-19225-5: 966 pp.
$50.00: Paperback: 978-0-521-14063-8

Logical Foundations of Proof Complexity

STEPHEN COOK AND PHUONG NGUYEN



This book treats bounded arithmetic and propositional proof complexity from the point of view of computational complexity. The first seven chapters include the necessary logical background for the material and are suitable for a graduate course. The result is a uniform treatment of many systems in the literature.

$80.00: Hardback: 978-0-521-51729-4: 492 pp.

Prices subject to change.

www.cambridge.org/us/mathematics
800.872.7423

CAMBRIDGE UNIVERSITY PRESS

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

CAMBRIDGE JOURNALS

Mathematical Structures in Computer Science

Mathematical Structures in Computer Science
is available online at:
http://journals.cambridge.org/msc

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

Editor-in-Chief
G. Longo, CNRS and Ecole Normale Supérieure, Paris, France

Mathematical Structures in Computer Science is a journal of theoretical computer science which focuses on the application of ideas from the structural side of mathematics and mathematical logic to computer science. The journal aims to bridge the gap between theoretical contributions and software design, publishing original papers of a high standard and broad surveys with original perspectives in all areas of computing, provided that ideas or results from logic, algebra, geometry, category theory or other areas of logic and mathematics form a basis for the work.

Price information is available at:
http://journals.cambridge.org/msc

Free email alerts
Keep up-to-date with new material – sign up at
http://journals.cambridge.org/alerts

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

CAMBRIDGE UNIVERSITY PRESS

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

CAMBRIDGE JOURNALS

PROBABILITY in the ENGINEERING and INFORMATIONAL SCIENCES

Probability in the Engineering and Informational Sciences
is available online at:
http://journals.cambridge.org/pes

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

Editor
Sheldon M. Ross, University of Southern California, USA

The primary focus of this journal is on stochastic modelling in the physical and engineering sciences, with particular emphasis on queueing theory, reliability theory, inventory theory, simulation, mathematical finance and probabilistic networks and graphs. Papers on analytic properties and related disciplines are also considered, as well as more general papers on applied and computational probability.

Price information is available at:
http://journals.cambridge.org/pes

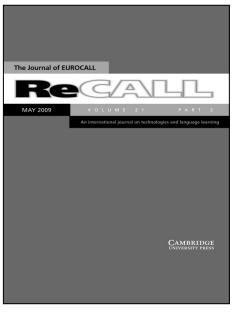
Free email alerts
Keep up-to-date with new material – sign up at
http://journals.cambridge.org/alerts

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

CAMBRIDGE UNIVERSITY PRESS

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

CAMBRIDGE JOURNALS



ReCALL

Published for the European Association for Computer Assisted Language Learning

ReCALL
is available online at:
http://journals.cambridge.org/rec

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

Editors
Françoise Blin, Dublin City University, Ireland
June Thompson, University of Hull, UK

The primary focus of *ReCALL* is the use of technologies for anguage learning and teaching. It aims to appeal to researchers and practitioners in the area of computer-assisted and technology-enhanced language learning, normally but not exclusively operating in universities. *ReCALL* is also of interest to language teachers in secondary and tertiary education who may be considering the introduction of technologies into their teachingpractice.

Price information is available at:
http://journals.cambridge.org/rec

Free email alerts
Keep up-to-date with new material – sign up at
http://journals.cambridge.org/alert

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

CAMBRIDGE UNIVERSITY PRESS

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

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 2010, January, March, May, July, September and November. The subscription price (excluding VAT) of Volume 20, 2010, is £370 net (USA, Canada and Mexico US$610) institutions print and electronic; institutions electronic only is £310, $500; individuals print only is £99, $165; Member rates available – please enquire; single parts cost £60 net (USA, Canada and Mexico US$120) plus postage. Six parts form a volume in 2010. 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 pending 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 0956-7968/10 $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.

Printed in the United Kingdom

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press

JOURNAL OF
Functional Programming

VOLUME 20 PART 2 MARCH 2010

CONTENTS

Experience report: Functional programming in C-Rules
JEREMY WAZNY 123

Lightweight checkpointing for concurrent ML
LUKASZ ZIAREK AND SURESH JAGANNATHAN 137

Parametricity, type equality, and higher-order polymorphism
DIMITRIOS VYTINIOTIS AND STEPHANIE WEIRICH 175

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

FSC
Mixed Sources
Product group from well-managed forests and other controlled sources
www.fsc.org Cert no. SA-COC-1527
© 1996 Forest Stewardship Council

CAMBRIDGE UNIVERSITY PRESS

https://doi.org/10.1017/S0956796810000109 Published online by Cambridge University Press