

INDEX

ALBRECHT, A., HOWLETT, P. and PUDNEY, P.; The cost–time curve for an optimal train journey on level track	10
ALGHALITH, M.; A note on a new approach to both price and volatility jumps: an application to the portfolio model	182
ALI, N.; see ZAMAN, A.	96
ANDERSSSEN, R. S., DAVIES, A. R., de HOOG, F. R. and LOY, R. J.; Simple joint inversion localized formulae for relaxation spectrum recovery	1
ANWAR BEG, O.; see ZAMAN, A.	96
BERRES, S., CORONEL, A., LAGOS, R. and SEPÚLVEDA, M.; Performance of a real coded genetic algorithm for the calibration of scalar conservation laws	51
BIAN, M.-K.; see FAN, T.-H.	265
BOLAND, J., HOWLETT, P., PIANTADOSI, J. and ZAKARIA, R.; Modelling and simulation of volumetric rainfall for a catchment in the Murray–Darling Basin	119
BRAVERMAN, E.; see SHEN, Y.	247
BROADBRIDGE, P., NELSON, M. and WANG, J.; Editorial: Mathematical methods for applications	209
CAO, F.; see CHEN, Z.	238
CAO, F.; see WANG, C.	231
CAO, H. X.; see CHEN, L.	436
CASAS, J. M., LADRA, M., OMIROV, B. A. and TURDIBAEV, R.; On the algebraic properties of the human ABO-blood group inheritance pattern	78
CHEN, L., MENG, H. X., CAO, H. X., HUANG, Y. F. and YANG, Y.; A note on Markovian quantum dynamics	436
CHEN, X., LIU, Y. and WAN, Z.; Optimal decision making for online and offline retailers under BOPS mode	187
CHEN, X., MENG, X., SONG, X. and SHAN, C.; Coverage performance of cognitive radio networks powered by renewable energy	287
CHEN, Y. and LUO, H.; Rare events in the stochastic Camassa–Holm equation	417
CHEN, Z. and CAO, F.; Approximation by spherical neural networks with zonal functions	238
CORONEL, A.; see BERRES, S.	51
DAS, K. P.; see DEBSARMA, S.	143
DAVIES, A. R.; see ANDERSSSEN, R. S.	1
DEBSARMA, S. and DAS, K. P.; Current-modified evolution equation for a broader bandwidth capillary–gravity wave packet	143
DONG, J. M., WANG, X. S., WANG, L. L. and HU, J. L.; Parallel machine scheduling with job delivery coordination	306
DONG, X.-M.; Learning gradients from nonidentical data	220

FAN, T.-H. and BIAN, M.-K.; Characterizations of the Borel σ -fields of the fuzzy number space	265
FAN, T.-H., SUN, S. and HE, P.-A.; The time required for allele frequency change	464
FANG, Q.; see WANG, S.	211
FANG, Q. and PENG, J.; Pinning synchronization of fractional-order complex networks by a single controller	324
FENG, J.; see WANG, S.	211
HAN, B.; see SHEN, Y.	247
HAN, S., HU, J. and ZHOU, D.; Competitive analysis of interrelated price online inventory problems with demands	368
HAN, Y.; see ZHANG, J.	406
HE, P.-A.; see FAN, T.-H.	464
HE, Z.-R.; see LIU, Y.	482
HE, Z. R.; see WANG, S. P.	474
de HOOG, F. R.; see ANDERSSEN, R. S.	1
HOWLETT, P.; see ALBRECHT, A.	10
HOWLETT, P.; see BOLAND, J.	119
HU, J.; see HAN, S.	368
HU, J.; see JIANG, Y.	314
HU, J. L.; see DONG, J. M.	306
HUANG, Y. F.; see CHEN, L.	436
ISHIMURA, N. and YOSHIDA, N.; On the convergence of discrete processes with multiple independent variables	379
JIANG, W.-F. and WANG, Z.; The invariant region for the equations of nonisentropic gas dynamics	428
JIANG, Y., ZHOU, P., WANG, H. and HU, J.; Scheduling on two parallel machines with two dedicated servers	314
JIN, Q.; see ZHANG, Q.	491
LADRA, M.; see CASAS, J. M.	78
LAGOS, R.; see BERRES, S.	51
LEI, H.; see ZHANG, Q.	491
LI, F., YE, Q. and ZHANG, X.; Isolated scattering number of split graphs and graph products	350
LIANG, Z.; see MING, Z.	162
LIU, Y.; see CHEN, X.	187
LIU, Y. and HE, Z.-R.; On the well-posedness of a nonlinear hierarchical size-structured population model	482
LOY, R. J.; see ANDERSSEN, R. S.	1
LU, X.; see ZHANG, J.	406
LU, Z.; see YANG, J.	256
LUO, H.; see CHEN, Y.	417

MENG, H. X.; see CHEN, L.	436
MENG, X.; see CHEN, X.	287
MENG, Y.-J.; The L_r convergence and weak laws of large numbers for $\tilde{\rho}$ -mixing random variables	455
MING, Z., LIANG, Z. and ZHANG, C.; Optimal mean–variance reinsurance with common shock dependence	162
NELSON, M.; see BROADBRIDGE, P.	209
OMIROV, B. A.; see CASAS, J. M.	78
PEI, D. and ZHU, Y.; New generalized h -implications	276
PENG, J.; see FANG, Q.	324
PIANTADOSI, J.; see BOLAND, J.	119
PUDNEY, P.; see ALBRECHT, A.	10
SAJID, M.; see ZAMAN, A.	96
SEPÚLVEDA, M.; see BERRES, S.	51
SHAN, C.; see CHEN, X.	287
SHEN, Y., HAN, B. and BRAVERMAN, E.; Image inpainting from partial noisy data by directional complex tight framelets	247
SHI, Y. F.; see TAO, X.-X.	386
SONG, X.; see CHEN, X.	287
SUN, S.; see FAN, T.-H.	464
TAO, X.-X. and SHI, Y.-F.; On multi-asset spread option pricing in a Wick–Itô–Skorohod integral framework	386
TURDIBAEV, R.; see CASAS, J. M.	78
VAN GOETHEM, N.; Direct expression of incompatibility in curvilinear systems	33
WAN, Z.; see CHEN, X.	187
WANG, C. and CAO, F.; A study on the error of distributed algorithms for big data classification with SVM	231
WANG, H.; see JIANG, Y.	314
WANG, J.; see BROADBRIDGE, P.	209
WANG, L. L.; see DONG, J. M.	306
WANG, Q.; see WU, L.	333
WANG, Q. and WU, L.; Network design for minimum spanning trees under Hamming distance	342
WANG, S., FANG, Q. and FENG, J.; An alternative method of concept learning	211
WANG, S. P. and HE, Z. R.; Approximate controllability of population dynamics with size dependence and spatial distribution	474
WANG, X. S.; see DONG, J. M.	306
WANG, Z.; see JIANG, W.-F.	428
WU, L.; see WANG, Q.	342
WU, L., WANG, Q. and YANG, X.; Computational methods for logistics problems related to optimal trees	333

XIA, Z. N.; Dynamics of pseudo almost periodic solution for impulsive neoclassical growth model	359
XU, Y.-M.; see ZHANG, B.-L.	446
YANG, C.; see ZHANG, B.-L.	397
YANG, J., ZHANG, L. and LU, Z.; The Mellin central projection transform	256
YANG, X.; see WU, L.	333
YANG, Y.; see CHEN, L.	436
YE, M.; see ZHANG, Q.	491
YE, Q.; see LI, F.	350
YOSHIDA, N.; see ISHIMURA, N.	379
ZAKARIA, R.; see BOLAND, J.	119
ZAMAN, A., ALI, N., ANWAR BEG, O. and SAJID, M.; Unsteady two-layered blood flow through a w -shaped stenosed artery using the generalized Oldroyd-B fluid model	96
ZHANG, B.-L. and XU, Y.-M.; Delayed fuzzy H_∞ control of offshore steel jacket platforms	446
ZHANG, B.-L. and YANG, C.; Delayed state feedback H_∞ control for periodic-review inventory systems	397
ZHANG, C.; see MING, Z.	162
ZHANG, J., LU, X. and HAN, Y.; Pricing perpetual timer option under the stochastic volatility model of Hull–White	406
ZHANG, L.; see YANG, J.	256
ZHANG, Q., YE, M., LEI, H. and JIN, Q.; Asymptotic behaviour of a class of resource competition biology species system by the fractional Brownian motion	491
ZHANG, X.; see LI, F.	350
ZHOU, D.; see HAN, S.	368
ZHOU, P.; see JIANG, Y.	314
ZHU, Y.; see PEI, D.	276

PREPARATION OF MANUSCRIPTS

The ANZIAM Journal is typeset in L^AT_EX. Style files are available from <http://www.austms.org.au/Publ/ANZIAM/authorinfo.shtml>.

The manuscript should conform to the following rules. In case of any doubt, authors are advised to refer to previous papers in the Journal.

1. Abstract, title and author details. An abstract not exceeding 300 words should be included in the manuscript. If the title is long, supply also a shortened form of the title not exceeding 40 characters, including spaces. Addresses should be shown under the authors name, including e-mail address if available.

2. Main headings. Main headings should be numbered, centred and shown thus:

2. Preliminary results

3. Theorems. The titles LEMMA, THEOREM, COROLLARY, REMARK, DEFINITION *etc.* should be left-justified and numbered consecutively with arabic numerals, *e.g.*

LEMMA 1.1. The content of the lemma, theorem *etc.* should follow, as here.

4. Acknowledgements. If acknowledgements of support and assistance are made, these should be given at the end of the article. Footnotes should be avoided.

5. Equations. Equations should be punctuated to conform to their place in the syntax of the sentence. Equation numbers should be shown on the right in round brackets.

6. References. The reference list should be in ALPHABETICAL ORDER by name of first author, preceded by a reference number in square brackets. These references should be cited in the text by giving the appropriate number in square brackets. The following layout for books, journal articles, theses, articles in books, and conference proceedings respectively, must be followed.

- [1] M. Abramowitz and I. A. Stegun (eds), *Handbook of mathematical functions* (Dover, New York, 1970).
- [2] S. N. Biswas and T. S. Santhanam, "Coherent states of para-Bose oscillators", *J. Austral. Math. Soc. Ser. B* **22** (1980) 210–217.
- [3] F. H. Busse, "On the mean field problem of thermal convection", *Max-Planck Inst. Phys. Astrophys. Rep. MPI-PAE/Astro* **31** (1970) 1–31.
- [4] E. M. Casling, "Slender planing surfaces", Ph. D. Thesis, University of Adelaide, 1978.
- [5] R. H. Day, "Adaptive process and economic theory", in *Adaptive economic models* (eds R. H. Day and T. Groves), (Academic Press, New York, 1975) 1–38.
- [6] J. W. Miles, "Resonant response of harbors (the harbor paradox revisited)", *Proc. 8th Symp. Naval Hydro.* (1970) 95–115.

7. Tables. Each should be preceded by a caption beginning: TABLE 1 (or 2, 3, *etc.*)

8. Figures. Each figure should have a caption beginning: FIGURE 1 (or 2, 3, *etc.*)

Authors should provide diagrams drawn to professional standards in the form of encapsulated Postscript files. Other forms of diagrams drawn to professional standard may be acceptable, however this may also necessitate a payment from the author(s) to cover additional cost involved in processing them.

SUBMISSION OF MANUSCRIPTS

Prior to submission authors are asked to read the section "Preparation of Manuscripts" on the previous page.

Authors of articles submitted for publication in The ANZIAM Journal are asked to ensure that their manuscripts are in a form suitable for sending to the printer. Editors reserve the right to return poorly presented material to authors for revision.

The author should submit a pdf file if possible to the Online Journal System. Follow the instructions at <http://anziamj.austms.org.au/ojs/index.php/ANZIAMJ/user/register>.

It will speed up processing of accepted papers if a \LaTeX version of the manuscript is available. It is not necessary to send such a file with the submitted paper. This will be requested if the paper is accepted.

Authors of accepted papers will be provided with a complimentary electronic version of their paper as published.

Excessive costs incurred by the Australian Mathematical Society through corrections to or withdrawal of articles may be charged to the authors concerned.

Submission of a paper to The ANZIAM Journal is a representation by the author that the manuscript has not been copyrighted or published, and that it is not being considered for publication elsewhere.

THE ANZIAM JOURNAL AND THE ELECTRONIC SUPPLEMENT

The Journal of the Australian Mathematical Society began publication in 1959, and from 1975 appeared in two series, Series A (Pure Mathematics and Statistics) and Series B (Applied Mathematics). Series B is now The ANZIAM Journal and is published in volumes comprising four quarterly parts. There is also a fifth (electronic) part designed for rapid publication (<http://anziamj.austms.org.au/ojs/index.php/ANZIAMJ>). The Editor-in-Chief is A. J. Roberts, School of Mathematical Sciences, The University of Adelaide, ADELAIDE, SA 5005; anthony.roberts@adelaide.edu.au. All five parts are refereed. All accepted papers have the option of publication in the electronic part.

It is the editorial policy of The ANZIAM Journal to consider papers in any field of applied mathematics and related mathematical sciences. Novel applications of mathematics in real situations are especially welcome. All papers must include some indication of applicability, and an introduction that can be understood by non-specialist readers from the whole applied mathematical community.



Cambridge Core

The new home of
Cambridge Journals
cambridge.org/core

Cambridge Core



Techniques related to finance and economics

- Dynamics of pseudo almost periodic solution for impulsive neoclassical growth model**
Xia, Z. N. 359
- Competitive analysis of interrelated price online inventory problems with demands**
Han, S., Hu, J. & Zhou, D. 368
- On the convergence of discrete processes with multiple independent variables**
Ishimura, N. & Yoshida, N. 379
- On multi-asset spread option pricing in a Wick–Itô–Skorohod integral framework**
Tao, X.-X. & Shi, Y.-F. 386
- Delayed state feedback H_∞ control for periodic-review inventory systems**
Zhang, B.-L. & Yang, C. 397
- Pricing perpetual timer option under the stochastic volatility model of Hull–White**
Zhang, J., Lu, X. & Han, Y. 406

Techniques related to mechanics

- Rare events in the stochastic Camassa–Holm equation**
Chen, Y. & Luo, H. 417
- The invariant region for the equations of nonisentropic gas dynamics**
Jiang, W.-F. & Wang, Z. 428
- A note on Markovian quantum dynamics**
Chen, L., Meng, H. X., Cao, H. X., Huang, Y. F. & Yang, Y. 436
- Delayed fuzzy H_∞ control of offshore steel jacket platforms**
Zhang, B.-L. & Xu, Y.-M. 446
- The L_r convergence and weak laws of large numbers for $\tilde{\rho}$ -mixing random variables**
Meng, Y.-J. 455

Techniques related to biology and ecology

- The time required for allele frequency change**
Fan, T.-H., Sun, S. & He, P.-A. 464
- Approximate controllability of population dynamics with size dependence and spatial distribution**
Wang, S. P. & He, Z. R. 474
- On the well-posedness of a nonlinear hierarchical size-structured population model**
Liu, Y. & He, Z.-R. 482
- Asymptotic behaviour of a class of resource competition biology species system by the fractional Brownian motion**
Zhang, Q., Ye, M., Lei, H. & Jin, Q. 491
- Author Index** 500

THE AUSTRALIAN MATHEMATICAL SOCIETY

<i>President:</i>	T. MARCHANT	School of Mathematics and Applied Statistics University of Wollongong NSW 2522, Australia
<i>Secretary:</i>	P. J. STACEY	Department of Mathematics and Statistics La Trobe University Bundoora Victoria 3086, Australia
<i>Treasurer:</i>	A. HOWE	Department of Mathematics Mathematical Sciences Institute The Australian National University Canberra ACT 0200, Australia

Membership and correspondence: Applications for membership, notices of changes of address or title or position, members' subscriptions and correspondence related to accounts should be sent to the Treasurer. All other correspondence should be sent to the Secretary.

Subscriptions: Four parts are planned for 2017. Subscription prices for 2017 are £343 (\$631 in USA, Canada and Mexico) which includes print and electronic access. The electronic-only access price for 2017 is £289 (\$509 in USA, Canada and Mexico). Single parts cost £99 (\$181 in USA, Canada and Mexico). Prices include delivery by air where appropriate. EU subscribers 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, should be sent to a subscription agent, book-seller, or direct to the publishers: Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS or, in the USA, Canada and Mexico, Cambridge University Press, Journals Fulfilment Department, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA. Japanese prices are available from Kinokuniya Company Ltd, PO Box 55, Chitose Tokyo 156, Japan. Periodicals postage is paid at New York, NY and additional mailing offices. POSTMASTER: send address changes in USA, Canada and Mexico to *The ANZIAM JOURNAL*, Cambridge University Press, Journals Fulfilment Department, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA.

This journal is included in the Cambridge Journals Online service. Further information, and online access for subscribers, is available at <http://journals.cambridge.org/anz>.

Copying: This journal is registered with the Copyright Clearance Centre, 222 Rosewood Drive, Danvers, MA 01923, USA. Organizations in the USA who are registered with the CCC may therefore copy materials beyond the limits permitted by sections 107 and 108 of US copyright law subject to payment to CCC of the per-copy fee of \$16.00. This consent does not extend to multiple copying for promotional and commercial purposes. Code 1446-1811/2017 \$16.00.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions. For all other use, permission should be sought from Cambridge or the American branch of Cambridge University Press.

Published by Cambridge University Press for the Australian Mathematical Publishing Association Incorporated. Printed in the United Kingdom at Bell & Bain Ltd, Glasgow.

© 2017 Australian Mathematical Publishing Association Inc.



This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see www.fsc.org for information.

Table of Contents

Editorial: Mathematical methods for applications <i>Broadbridge, P., Nelson, M. & Wang, J.</i>	209
Techniques related to signal analysis and machine learning	
An alternative method of concept learning <i>Wang, S., Fang, Q. & Feng, J.</i>	211
Learning gradients from nonidentical data <i>Dong, X.-M.</i>	220
A study on the error of distributed algorithms for big data classification with SVM <i>Wang, C. & Cao, F.</i>	231
Approximation by spherical neural networks with zonal functions <i>Chen, Z. & Cao, F.</i>	238
Image inpainting from partial noisy data by directional complex tight framelets <i>Shen, Y., Han, B. & Braverman, E.</i>	247
The Mellin central projection transform <i>Yang, J., Zhang, L. & Lu, Z.</i>	256
Characterizations of the Borel σ-fields of the fuzzy number space <i>Fan, T.-H. & Bian, M.-K.</i>	265
New generalized h-implications <i>Pei, D. & Zhu, Y.</i>	276
Techniques related to graphs and networks	
Coverage performance of cognitive radio networks powered by renewable energy <i>Chen, X., Meng, X., Song, X. & Shan, C.</i>	287
Parallel machine scheduling with job delivery coordination <i>Dong, J. M., Wang, X. S., Wang, L. L. & Hu, J. L.</i>	306
Scheduling on two parallel machines with two dedicated servers <i>Jiang, Y., Zhou, P., Wang, H. & Hu, J.</i>	314
Pinning synchronization of fractional-order complex networks by a single controller <i>Fang, Q. & Peng, J.</i>	324
Computational methods for logistics problems related to optimal trees <i>Wu, L., Wang, Q. & Yang, X.</i>	333
Network design for minimum spanning trees under Hamming distance <i>Wang, Q. & Wu, L.</i>	342
Isolated scattering number of split graphs and graph products <i>Li, F., Ye, Q. & Zhang, X.</i>	350

(Continued on back page)

Cambridge Core

For further information about this journal please go to the journal website at:

cambridge.org/anz

<https://doi.org/10.1017/S1446181116000249> Published online by Cambridge University Press



CAMBRIDGE
UNIVERSITY PRESS