CHIEF EDITORS

M. P. Bekakos (Greece)

M. Sambandham (U.S.A)

EDITORIAL BOARD

H. Adeli (U.S.A)

Ajith Abraham (Korea)

R. P. Agarwal (U.S.A)

Baruch Cahlon (USA)

C. Y. Chan (U.S.A)

Vassilios Chouliaras (U.K)

L. T. Grujic (France)

D. Kannan (U.S.A)

G. S. Ladde (U.S.A)

N. G. Medhin (U.S.A)

I. Z. Milovanovic (Serbia)

R. Montenegro Armas (Spain)

Ahmed S. Moussa (Egypt)

R. Natarajan (India)

A. Paccanaro (U.K)

S. G. Sedukhin (Japan)

L. A. Zadeh (USA)

D. Zhang (Hong Kong)

Albert Zomaya (Australia)

September and December 2017 Volume 25, Number 3 & 4 ISSN 1061 5369

NEURAL, PARALLEL & SCIENTIFIC COMPUTATIONS

DYNAMIC PUBLISHERS • USA

Neural, Parallel & Scientific Computations

The aim of this quarterly journal is to provide an international forum for the information in the theory and practice of Neural, Parallel & Scientific Computations. This journal publishes carefully selected original research papers on all aspects of neural, parallel and scientific computing from Computational Mathematics, Biomedical Engineering, Artificial Intelligence, Systolic Algorithms, Evaluation and Prediction of Computer Complexes, Cluster Computing, Computational Complexity, VLSI Design, Computer Architectures, Simulation, ODL (Open Distance Learning) Systems, Systems Security, Combinatorics, Graph Theory, Numerical Analysis, etc.

Articles published in **Neural, Parallel and Scientific Computations** are indexed or abstracted in: Computer Abstracts; Computer & Control Abstracts; Computer Information System Abstracts; Computer Literature Index; Computer Review; Ergonomics Abstracts; Abstract Journal, USSR Academy of Sciences; Zentralblat fur Mathematik/Mathematics Abstracts; Mathematical Reviews; Current Mathematical Publications; MathSci.

Neural, Parallel and Scientific Computations (ISSN 1061-5369) is published quarterly by Dynamic Publisher, Inc, Atlanta, GA 30362, USA, in the months of March, June, September, and December.

Copyright © 2017. No part of **Neural, Parallel and Scientific Computations** may be reproduced or transmitted in any form or by any means without written permission from the publisher. **Neural, Parallel and Scientific Computations** has been registered with the Copyright Clearance Center (CCC) Transactional Reporting Services. Consent is given for copying of articles for personal or internal use, or for the personal use of specific clients provided that the base fee \$15.00 (per copy, per article) is paid directly to CCC, 27 Congress St., Salem, MA 01970 USA. For those organizations that have been granted a photo copy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Service is 1061 5369/93 \$15.00.

Subscription Rates: Volume 25 (2017)

Library/Institutional: US\$ 600.00; Personal: US\$ 250.00

(All countries except USA add US\$ 80.00 for Air Mail). Subscription and all other inquires should be addressed to Neural, Parallel and Scientific Computations, Dynamic Publisher, Inc, P. O. BOX 48654, Atlanta, GA 30362-0654, USA. Editorial inquires should be directed to the EDITOR (M. Sambandham).

POSTMASTER: Send address changes to **Neural, Parallel and Scientific Computations,** Dynamic Publisher, Inc, P. O. BOX 48654, Atlanta, GA 30362-0654, USA.

PREFACE

This special issue is to bring together the interdisciplinary research on the growing fields of computational mathematics, mathematical modeling and applications of mathematics to nonlinear sciences.

Participants of the international conference on Applications of Mathematics to Nonlinear Sciences (AMNS-2016) held in Kathmandu, Nepal during May 26-29, 2016 were invited to contribute to this special issue. Seventeen articles were selected for publication covering mathematical biology, computational fluid dynamics, statistical models, operation research, as well as nonlinear systems, numerical methods and analysis.

We would like to express our sincere thanks to the authors and referees for their contributions.

H. Khanal

Embry-Riddle Aeronautical University Daytona Beach, FL 32114

H. R. Joshi

Xavier University Cincinnati, OH 45207

October 20, 2017

Benedict Pineyro and Harihar Khanal Super time-stepping schemes for conduction-radiation heat transfer problem	457
Urmila Pyakurel Efficient algorithms for contraflow reconfiguration in evacuation planning	469
Shyam Sundar Sah and Ram Prashad Ghimire Reliability of general series-parallel and sequential series-parallel systems and their optimization	485
Ramjee Sharma On the numerical solutions of 2d Boussinesq equations with fractional dissipation	497
Subhash Shende, Mohan Kale, and Nikhil Gupte Modeling maternal-infant HIV transmission with lag time distributions exponential, geometric and shifted geometric	509
Content	523
Author Index	527

Neural, Parallel & Scientific Computations

Volume 25, Number 3 & 4, September and December 2017

CONTENTS

Vasilios Alexiades, Mustafa Zeki Elmas, and Gladys Alexandre Band formation in bacterial aerotaxis	307
Mohd Younus Bhat Wavelet packets with their Fourier properties on local fields of prime characteristic	313
Mitra Devkota and Gary Hatfield Spatial modeling techniques for Lattice Data	325
Frederique Drullion Growth of groups of wind generated waves	335
M. Z. Elmas, T. Mukherjee, G. Alexandre, and V. Alexiades A two pathways model for chemotactic signaling in Azospirillum Brasilense	345
Basu Dev Ghimire and Ram Prasad Ghimire Reliability and availability of machines with two types of failures operated under periodic surveillance test	359
Ram Ghimire, Samir Shrestha, Oliver Tse, and Shyam Sundar Sah Transient analysis of Markovian queue with flexible servers balking	375
Sushil Ghimire, Gyan Bahadur Thapa, and Ram Prasad Ghimire Finite capacity M/M/r/N queueing model with additional servers	385
Dadang Hamzah, Johan Tuwankotta, and Yudi Soeharyadi On the numerical solution of Fisher's equation by iterative operator-splitting method	395
Mark Miller and Hem Raj Joshi Modeling harmful algal blooms in the western basin of lake Erie and an economic solution	403
Ashok Misra Modeling boundary layer flow and heat transfer of a particulate suspension	417
Shiv Prashad Neupane and Dil Bahadur Gurung Stability analysis of May's two prey and two predator model (Continued in back of	435