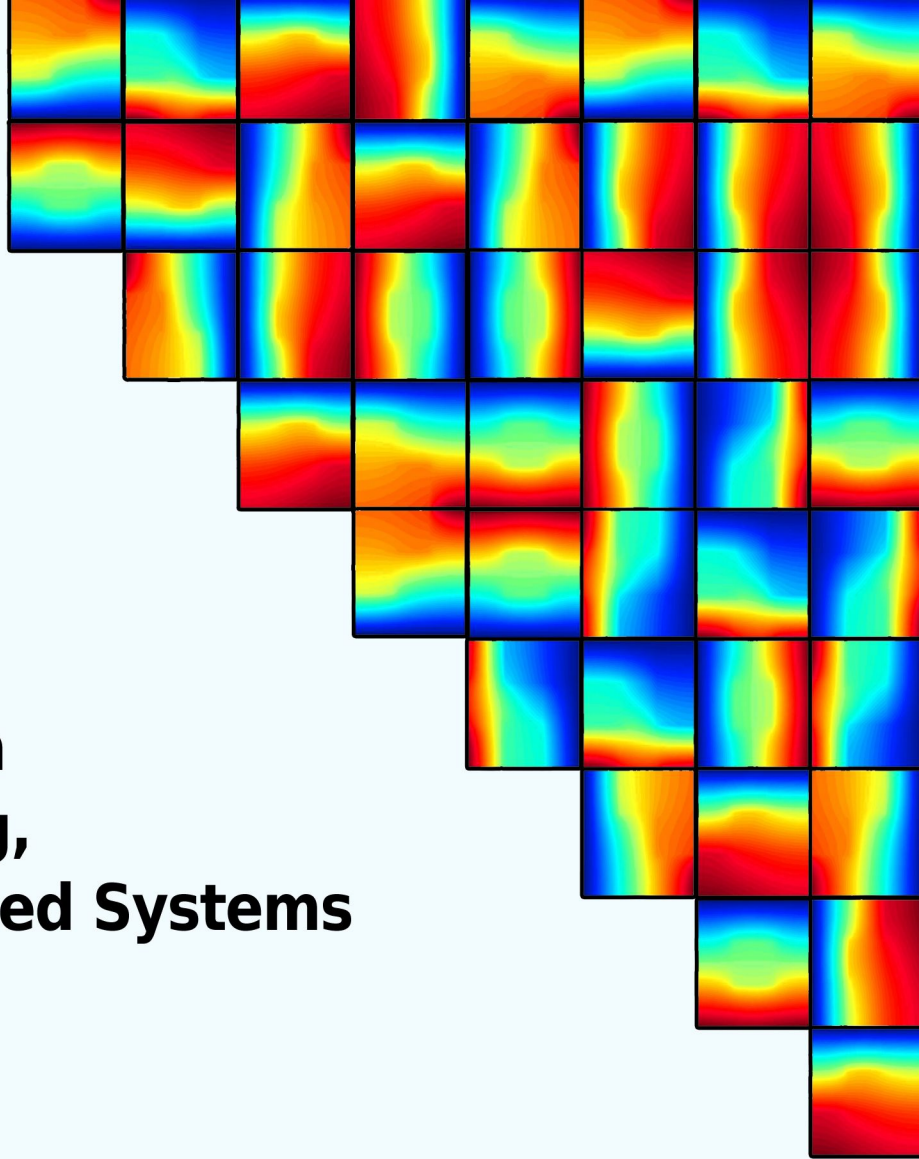




**Editors: Zoran Bojkovic,
Janusz Kacprzyk, Nikos Mastorakis,
Valeri Mladenov, Roberto Revetria,
Lotfi A. Zadeh, Alexander Zemliak**



Recent Researches in Software Engineering, Parallel and Distributed Systems

Recent Researches in Software Engineering, Parallel and Distributed Systems

**10th WSEAS International Conference on
Software Engineering, Parallel and Distributed Systems (SEPADS '11)**



Cambridge, UK, February 20-22, 2011

**ISBN: 978-960-474-277-6
PRINT VERSION ISSN: 1792-8095
ELECTRONIC VERSION ISSN: 1792-8109**



RECENT RESEARCHES in SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS

**10th WSEAS International Conference on SOFTWARE
ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS
(SEPADS '11)**

**Cambridge, UK
February 20-22, 2011**

RECENT RESEARCHES in SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS

**10th WSEAS International Conference on SOFTWARE
ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS
(SEPADS '11)**

**Cambridge, UK
February 20-22, 2011**

Published by WSEAS Press
www.wseas.org

Copyright © 2011, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: <http://www.worldses.org/review/index.html>

ISSN: 1792-8095
ISBN: 978-960-474-277-6



World Scientific and Engineering Academy and Society

RECENT RESEARCHES in SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS

**10th WSEAS International Conference on SOFTWARE
ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS
(SEPADS '11)**

**Cambridge, UK
February 20-22, 2011**

Editors:

Prof. Zoran Bojkovic, University of Belgrade, SERBIA
Prof. Janusz Kacprzyk, International Fuzzy Systems Association, POLAND
Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA
Prof. Valeri Mladenov, Technical University of Sofia, BULGARIA
Prof. Roberto Revetria, University of Genoa, ITALY
Prof. Lotfi A. Zadeh, University of California, USA
Prof. Alexander Zemliak, Autonomous University of Puebla, MEXICO

International Program Committee Members:

Pierre Borne, FRANCE
Bogdan Gabrys, UK
Demterios Kazakos, USA
F.-K. Benra, GERMANY
Dana Simian, ROMANIA
Calin Ciufudean, ROMANIA
Yang Li-Shang, TAIWAN
Urszula Ledzewicz, USA
Ioannis Pountourakis, GREECE
M. Isabel Garcia-Planas, SPAIN
Fathi M. Allan, UAE
Andris Buikis, LATVIA
Akshai Aggarwal, CANADA
Blyden, USA
Valeri Mladenov, BULGARIA
Zoran S. Bojkovic, SERBIA
Nikos C. Tsourveloudis, GREECE
Angel Fernando Kuri Morales, MEXICO
Fumiaki Imado, JAPAN
Ioannis Gonos, GREECE
Irina Zheliazkova, BULGARIA
A. Andreatos, GREECE
G. R. Dattatreya, USA

Preface

This year the 10th WSEAS International Conference on SOFTWARE ENGINEERING, PARALLEL and DISTRIBUTED SYSTEMS (SEPADS '11) was held in Cambridge, UK, February 20-22, 2011. The conference remains faithful to its original idea of providing a platform to discuss component technologies, software design, program analysis, software architecture, extreme programming, interprocessor communications, parallel languages and compilers, models of computation, performance measurements, real-time, reliability and fault-tolerance issues, wireless networks, routing algorithms etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

Table of Contents

<u>Plenary Lecture 1: The Basic Theory and an Efficient Soft Computing for a New Simulation Approach on several Models of Optimal Stock Management in the Deterministic Case</u>	12
<i>Nicolae Popoviciu</i>	
<u>Live Replication of Virtual Machines</u>	15
<i>Violeta Medina, Juan Manuel Garcia</i>	
<u>Simplified Bi-Directional Transformation of UML Activities into Petri Nets</u>	24
<i>Anthony Spiteri Staines</i>	
<u>Representing Petri Net Structures as Directed Graphs</u>	30
<i>Anthony Spiteri Staines</i>	
<u>χ^2 Test of Goodness of Fit for One-Dimensional and Multidimensional Normal Distribution, in Specified Case and Unspecified Case, with C++ Source Program</u>	36
<i>Nicolae Popoviciu, Floarea Baicu</i>	
<u>Consideration on New Theoretical Solutions of Special Electric Machines Using Specialized Soft of Electromagnetic Field Numerical Analysis</u>	51
<i>Nicolae Jula, Tudor Ursu, Nicolae Popoviciu, Costin Cepisca, Radu Obreja</i>	
<u>Apply E-learning Platform in Teaching Electronic Communication Course</u>	57
<i>Jui-Chen Yu, Hsueh-Chih Lin, Lung-Hsing Kuo, Shang Ming Su, Chang-Tzuoh Wu, Hung-Jen Yang, Hsieh-Hua Yang</i>	
<u>A Probabilistic Model for Risk Forecasting in Medical Informatics</u>	62
<i>Basit Shahzad, Azween B. Abdullah, Yousef Al-Ohali</i>	
<u>Challenges of a Project-Based Learning Approach Towards Requirement Engineering</u>	66
<i>Nor Azliana Akmal Jamaludin, Shamsul Sahibuddin, Nur Hafizah Hidayat</i>	
<u>Prolonging the Lifetime of Wireless Sensor Networks Using Multi-Level Clustering and Heterogeneity</u>	72
<i>Surender Soni, Vivek Katiyar</i>	
<u>Cooperative Caching in Mobile Ad Hoc Networks Through Clustering</u>	78
<i>Narottam Chand, Naveen Chauhan</i>	
<u>Users' Perspective of Software Quality</u>	84
<i>Anas Bassam AL-Badareen, Mohd Hasan Selamat, Marzanah A. Jabar, Jamilah Din, Sherzod Turaev</i>	
<u>GreenEve2Peace: An Advising and Scheduling Management Platform for Farming Community</u>	90
<i>Mohd. Azam Osman, Abdullah Zawawi Talib, Maziani Sabudin, Wong Poh Lee</i>	
<u>Parallel Shape Transformation Using Slices</u>	96
<i>Shamima Yasmin, Abdullah Zawawi Talib</i>	

<u>Range Free Localization Schemes for Wireless Sensor Networks</u>	101
<i>Ashok Kumar, Vinay Kumar, Vinod Kapoor</i>	
<u>Classifications and Feature Analysis Method for Sort Algorithm Programs Based on Program Structure Formalized Method</u>	107
<i>Kishimoto Yorinori</i>	
<u>Deployment of Payment Web Service in Multimedia Networks</u>	112
<i>Ivaylo Atanasov, Evelina Pencheva, Dora Marinska</i>	
<u>A Formal Approach to Service Interaction Detection in Mobile Networks</u>	118
<i>Ivaylo Atanasov, Evelina Pencheva</i>	
<u>Improving Object-Oriented Lack-of-Cohesion Metric by Excluding Special Methods</u>	124
<i>Jehad Al Dallal</i>	
<u>Graduation Project Online Management System: ALHOSN University Case Study</u>	130
<i>Adel Khelifi, Murad Al-Rajab, Sara Karem, Lamia Subhi</i>	
<u>Some Travelling Wave Solutions for a Generalized Benjamin-Bona-Mahony-Burgers Equation by Using MAXIMA Program</u>	138
<i>Maria S. Bruzon, Maria L. Gandarias</i>	
<u>Java Bridge Module and Java API for SID Simulator</u>	144
<i>Hasrul Maruf, Febiansyah Hidayat, Jin Baek Kwon</i>	
<u>Modeling a Jackson Networks with Series Queues Using a Temporis Stochastic Coloured Petri Nets</u>	148
<i>Popa Mariana, Dragan Mihaita, Popa Marin</i>	
<u>Symmetries and Conservation Laws for a Subclass of Lubrication Equations by Using Free Software</u>	153
<i>Maria Luz Gandarias, Maria Santos Bruzon</i>	
<u>Clustering Routing Protocol Based on Location Node in Wireless Sensor Networks</u>	160
<i>Nurhayati, Kyung Oh Lee</i>	
<u>A Method for Detecting Unusual Defects in Enterprise System Using Model Checking Techniques</u>	165
<i>Yoshitaka Aoki, Saeko Matsuura</i>	
<u>A Study for Representations of Distributed Cooperative Search Algorithms Based on Pseudo-Trees</u>	172
<i>Toshihiro Matsui, Hiroshi Matsuo</i>	
<u>Multimodal Metaphors for Note Taking in E-Learning</u>	180
<i>Dimitrios Rigas, Mohamed Sallam</i>	
<u>Guidelines for Edutainment in E-Learning Systems</u>	185
<i>Dimitrios Rigas, Khaled Ayad</i>	
<u>OptimalSQM: Optimal Software Quality Management Framework Architecture</u>	189
<i>Ljubomir Lazic, Ejub Kajan, Nikos E. Mastorakis</i>	

<u>A Comparison of Two Parallel Algorithms Using Predictive Load Balancing for Video Compression</u>	200
<i>Carlos-Julian Genis-Triana, Abelardo Rodriguez-Leon, Rafael Riveralopez</i>	
<u>CAR Based Safety Model in Automotive Software Engineering</u>	206
<i>Chandrasekaran S., Vijaya Raman P., Vijayravikumar R. S.</i>	
<u>Authors Index</u>	212

Plenary Lecture 1

The Basic Theory and an Efficient Soft Computing for a New Simulation Approach on several Models of Optimal Stock Management in the Deterministic Case



Professor Nicolae Popoviciu
Hyperion University of Bucharest
Faculty of Mathematics-Informatics
Street Calarasilor 169, Bucharest, ROMANIA
E-mail: nicolae.popoviciu@yahoo.com

Abstract: The work is a generalization of three Wilson's models related with the gestion (management) of stocks in the deterministic case. A new variable r , called stock rate or simulation rate, appears in all models. This variable assures a better stock controlling by deterministic simulation method. For $r = 1/2$ we obtain all Wilson's results from the bibliography [4], [5]. For each economical model the mathematical foundation is given, together with several numerical applications and economical interpretations. All models are based on the same notations with their specific meanings. So we used the following notations:

N = The total number of supplies

h = The period length (the number of days, let us say) between two supplies; h is constant.

c_L = The launch cost for one demand of supply (the ordering cost per one order)

c_H = The holding cost (in warehouse) unit cost, per day

c_P = The penalty cost per item, per day (when the stock s is less then the client's demand)

W = The production rate of the factory, on the unit time (the model 3)

D = The client's demand rate on the unit time (the model 3)

From time in time the manager has to stop the production activity, otherwise the whole quantity WT is too big, i.e. $WT \gg Q$.

t_W = The working time (the production time) for the factory or industrial unit

t_S = The stop time (the factory doesn't work)

t_{WP} = The working time and the penalty time for the factory because the client's demands are not satisfied

t_P = The penalty time and stop time

$C_r(q)$ = The total cost (composed of the ordering and holding cost) for interval , in model 1

$C_r(q, s)$ = The total cost (composed of the ordering, holding and penalty cost) for interval $[0, T]$, in model 2

$C_r(t_S, t_P)$ = The total cost (composed of the production cost and ordering, holding and penalty cost) for the interval $[0, T]$, in model 3

In the above description the elements $T, Q, W, D, c_L, c_H, c_P$ and r are **input data**

The elements $q, s, N, h, t_S, t_P, t_W, t_{WP}$ are **unknown data** (positive real numbers).

They must be found by using the mathematical models for the maintenance stock problem

The aim of the stock theory is to determine the best values q^* (model 1), q^*, s^* (model 2), t_S^*, t_P^* (model 3) which minimize **the total maintenance costs**, respectively

$$C_r(q^*) = \min_{q \in (0, \infty)} C_r(q)$$

$$C_r(q^*, s^*) = \min_{q \in (0, \infty), s \in (0, \infty)} C_r(q, s)$$

$$C_r(t_S^*, t_P^*) = \min_{t_S \in (0, \infty), t_P \in (0, \infty)} C_r(t_S, t_P)$$

Each mathematical model generates an informatics model and a C++ program. So, the work contains three C++ valid programs: source codification, numerical output results and print screen. The C++ simulation programs have been validated by supplementary techniques and independent computations. By simulation with various values of r a good manager has the possibility to choose the best version of his activity.

Brief Biography of the Speaker: Popoviciu Nicolae is PhD in mathematics (from 1976), professor at Hyperion University of Bucharest, Romania, Faculty of Mathematics-Informatics and the dean of this faculty. His area of competence contains: stochastic processes and Markov decision problems, integral transforms (continuous, discrete, fast Fourier transform, discrete Fourier transform), complex functions, field theory, distribution theory, tensor computation, mathematical programming (linear, multi-objective, quadratic, convex, nonlinear, stochastic, in integer numbers, Boolean) and optimization models, artificial neural networks and applications. He is the first author of 18 books (all in Romanian language) and 102 papers (almost all in English language) and more exactly the first author of 89 papers. His recently book Neural Networks. Mathematical Foundation, Algorithms and Applications (2009, Romanian language) is a monograph on the algorithms of neural networks with application.

Professor Popoviciu is member of Romanian Society of Mathematics and member of the Romanian Probability and Statistics Society. He has participated to many WSEAS International Conference: plenary speaker, author, co-author, chairman, reviewer etc (Romania, Greece, Turkey, Bulgaria, United Kingdom, USA).