

# INFO COMP

Journal of Computer Science

## Ministério da Educação

Ministro: Fernando Haddad

Reitor: Antônio Nazareno Guimarães Mendes

Vice-Reitor: Ricardo Pereira Reis

Pró-Reitor de Pesquisa: José Roberto Soares Scolforo

## Editora UFLA

Diretoria Executiva: Marco Antônio Rezende Alvarenga (Diretor)

Nilton Nagib J. Chalfun

Francisval de Melo Carvalho

VOLUME 6 – N.3 – 2007

## Editorial Board

### Editor-in-Chief

Luiz Henrique Andrade Correia, UFLA, Brazil

### Executive Editor

Heitor Augustus Xavier Costa, UFLA, Brazil

### Scientific Editors

Cláudia Linhares Sales, UFC, Brazil

Horácio Hideki Yanasse, INPE, Brazil

João M. R. da S. Tavares, FEUP, Portugal

Luiz Valter Brand Gomes, UFF, Brazil

Maria Luiza D'Almeida Sanches, UFF, Brazil

Muthu Ramachandran, Leeds Metr. Univ., UK

Nei Yoshihiro Soma, ITA, Brazil

Rudini Menezes Sampaio, UFLA, Brazil

### Associate Editors

Adolfo G. S. Seca Neto, IME, USP, Brazil

Adriana Giret, DSIC, UPV, Spain

Adrovane Marques Kade, URI, Brazil

Alessandra Macedo, USP, Brazil

Alessandro Marchetto, Milan University, Italy

Alexandre Álvaro, UFPE, Brazil

Alexandre Plastino, UFF, Brazil

Álvaro Rocha, GIMED, Portugal

Amaury Antônio de Castro Jr., UFMS, Brazil

Anderson de R. Rocha, UNICAMP, Brazil

André Luiz Zambalde, UFLA, Brazil

André Vital Saúde, UFLA, Brazil

Andrea Zotovici, Univ. São Judas Tadeu, Brazil

Anita Fernandes, Univali, Brazil

Anselmo Paiva, UFMA, Brazil

Antonio Maria Pereira de Resende, UFLA, Brazil

Antonio Pedro Timoszczuk, EPUSP, Brazil

Arnaldo de Albuquerque, UFMG, Brazil

Arnaldo Lyrio Barreto, UFRJ, FGV, Brazil

Ash Mohammad Abbas, Aligarh Muslim Univ., India

Asri Ngadi, Univ. Tech. of Malaysia, Malaysia

Bruno de Oliveira Schneider, UFLA, Brazil

Carlos Alberto Oliveira, Oklahoma State University, USA

Chandra S. Kanagaluru, JNTUCE, Índia

Christian Hofsetz, UNISINOS, Brazil

Claudio R. Jung, UNISINOS, Brazil

Cristiano Maciel, UFF, Brazil

Daniel Mesquita, LIRMM, France

Duong N. Binh Ta, Nanyang Tech. Univ. Singapore

Eder Mateus Nunes Gonçalves, FURG, Brazil

Elijah B. Rajsingh, Deemed University, India

Elisa Huzita, UEM, Brazil

Ernesto Rodrigues, FESPSP, Brazil

Fábio Henrique Viduani Martinez, UFMS, Brazil

Fábio Levy Siqueira, EPUSP, Brazil

Fátima L. S. Nunes, UNIVEM, Brazil

Fernando Koch, Univ. Utrecht, Holland

Fernando Santos Osório, UNISINOS, Brazil

Flávio Arnaldo Braga da Silva, UEM, Brazil

Fortunato S. Menezes, UFLA, Brazil

Francisco José da Silva e Silva, UFMA, Brazil

Frank José Affonso, EESC, USP, Brazil

Ganesh D. Bhutkar, Vishwakarma Inst. of Tech., India

Giani Carla Ito, INPE, Brazil

Heitor Augustus Xavier Costa, UFLA, Brazil

Hernán Astudillo, UTFSM, Chile

Hoang Trung Dinh, National Univ. Singapore

Hyggo Oliveira de Almeida, UFCEG, Brazil

Ildeberto A. Rodello, CUEM, Brazil

Janne Y. Y. Oeiras, UNICAMP, Brazil

João Carlos de M. Morselli Jr., PUC-Minas, Brazil

João Eduardo Ferreira, IME/USP, Brazil

João M. R. S. Tavares, FEUP, Portugal

Joaquim Quinteiro Uchôa, UFLA, Brazil

Johan M. Sharif - Swansea Univ., Great Britain

Johannes Mayer, Ulm University, Germany

Jorge Rady Almeida Junior, EPUSP, Brazil

José Luiz de Souza Pio, UFAM, Brazil

Kalinka R. L. J. C. Branco, FESR, Brazil

Katia Romero Felizardo, FALM, Brazil

Kechi Hiram, EPUSP, Brazil

Kleber Rocha de Oliveira, FIB, Brazil

Lucia Specia, USP, Brazil

Luiz Camolesi Jr., UNIMEP, Brazil

Luiz Carlos Begosso, FEM, Brazil

Luiz Henrique A. Correia, UFLA, Brazil

Luiz Ricardo Begosso, FEM, Brazil

Maluk Mohamed, M.A.M., Índia

Marco Aurélio Gerosa, PUC-Rio, Brazil

Maria Istela Cagnin, UNIVEM, Brazil

Marinalva Dias Soares, FABAN, Brazil

Marluce Rodrigues Pereira, UFLA, Brazil

Michel S. Soares, UFMG, Brazil

Miguel A. Salido, DSIC, UPV, Spain

Miguel A. R. Gonzalez, Univ. Rostock, Germany

Muthu Ramachandran, Leeds Univ., UK

Nandamudi Vijaykumar, LAC-INPE, Brazil

Nelkis de la Orden Medina, C.A D.T. Ltda, Brazil

Omar A. C. Cortes, CEFET, MA, Brazil

Paulo Eduardo Ambrósio, CUBM, Brazil

Plínio de Sá Leitão Júnior, UFLA, Brazil

Prabhat Mahanti, Univ. of Newbrunswick, Canada

Priti Sajja, Sardar Patel University, India

Ranjit Biswas, Inst. of Tech. & Manag., India

Reghunadhan Rajesh, Bharathiar University, India

Renato de Freitas Bulcão Neto, USP, Brazil

Robinson Pizzio, UFSC, Brazil

Rodrigo O. Plotze, USO, Brazil

Rodrigo Paes, PUC-Rio, Brazil

Rogéria C. Grato Souza, UNESP, Brazil

Rogério E. Garcia, UNESP, Brazil

Rosângela A. D. Penteado, UFSCar, Brazil

Rudini Menezes Sampaio, UFLA, Brazil

Sachin Kumar, CCS University, Índia

Sandro Ronaldo B. Oliveira, UNAMA, Brazil

Sanjay Garg, A.D. Patel Inst. of Tech., Índia

Sanjeev Sharma, RG TU, Índia

Seiji Isotani, Osaka University, Japan

Sérgio Martins de Souza, UFLA, Brazil

Siri Krishan Wasan, JMI, CU, Índia

Sudhir Agrawal, Rajiv Gandhi Tech. Univ., Índia

Syed F. Mustafa – Univ. of CAS, China

Udo Fritzsche Jr., PUC-Poços, Brazil

Valter F. Avelino, EPUSP, Brazil

Vicente Julian, Univ. Polit. de Valencia, Spain

Vinicius Cardoso Garcia, UFPE, Brazil

Vitus S.W. Lam, Univ. of Hong Kong, Hong Kong

Wilian Soares Lacerda, UFLA, Brazil

Yogendra K. Jain, Rajiv Gandhi Tech. Univ., Índia

## Technical Staff

Ângela M. S. Gonçalves (Secretary)

Deivson H. R. de Almeida (Secretary)

INFOCOMP – Journal of Computer Science – v.6, n.3 (2007) – Lavras: Universidade Federal de Lavras, 2007.

Anual (1999 - 2003), Semestral (2004), Trimestral (2005 - )

Sumários em Português e Inglês

ISSN 1807-4545

1. Ciência da Computação I. Universidade Federal de Lavras. II. Departamento de Ciência da Computação.

Indexed in:

CiteSeer

DEST

DOAJ

EBSCO

INSPEC

IS Journals

IS World

Solicita-se permuta/Exchange desired Tiragem/Quantity issued per print: 250