



**Ministério da Educação**

**Ministro:** Fernando Haddad

**Reitor:** Antônio Nazareno Guimarães Mendes

**Vice-Reitor:** José Roberto Soares Scolforo

**Pró-Reitora de Pesquisa:** Édila Vilela de Resende Von Pinho

**Ed. UFLA - Presidente do conselho editorial:** Renato Paiva

**Volume 10, no. 4, December of 2011.**

## Editorial Board

**Editor-in-Chief:** Sanderson L. Gonzaga de Oliveira, UFLA, Brazil

### Advisory Editors

Antônio José da Silva Neto, IPRJ-UERJ, Brazil

Horácio Hideki Yanasse, INPE, Brazil

Luiz Henrique Andrade Correia, UFLA, Brazil

Plínio de Sá Leitão Júnior, UFG, Brazil

Heitor Augustus Xavier Costa, UFLA, Brazil

João Manuel R. S. Tavares, FEUP, Universidade do Porto, Portugal

Muthu Ramachandran, Leeds Metropolitan University, UK

**Executive Editor:** Talles Heinfarth, UFLA, Brazil

### Scientific Editors

Alceu Britto Jr., PUC-PR, Brazil

Alice Kozakevicius, UFSM, Brazil

Anderson de Rezende Rocha, UNICAMP, Brazil

André Vital Saúde, UFLA, Brazil

Antônio Maria Pereira de Resende, UFLA, Brazil

Apkar Salatian, American University of Nigeria

Bruno de Oliveira Schneider, UFLA, Brazil

Claudio Cesar de Sá, UDESC, Brazil

Denilson Alves Pereira, UFLA, Brazil

Elisa Huzita, UEM, Brazil

Fábio Silveira, UNIFESP, Brazil

Frank José Affonso, UNESP, Brazil

Hyggo Almeida, UFCG, Brazil

Ildeberto Aparecido Rodello, USP, Brazil

Isabel Cafezeiro, UFF, Brazil

João Manuel R. S. Tavares, FEUP, Univ. do Porto, Portugal

Jorge Martinez-Gil, University of Malaga, Spain

José Luís Braga, UFV, Brazil

Luciana A. F. Martimiano, UEM, Brazil

Luiz Carlos Begosso, FEMA, Brazil

Luiz Henrique Andrade Correia, UFLA, Brazil

Marco Aurelio Gerosa, USP, Brazil

Marcos A. Cavenaghi, UNESP, Brazil

Marinalva Dias Soares, INPE, Brazil

Michel S. Soares, UFU, Brazil

Nahra Bencherait, University of Guelma, Algeria

Omar Andres Carmona Cortes, CEFET/MA, Brazil

Paulo Eduardo Ambrósio, UDESC, Brazil

Paulo Lopes de Souza, ICMC-USP, Brazil

Rajkumar Samanta, Megnad Saha Inst. of Tech., India

Renato de Freitas Bulcão Neto, UFG, Brazil

Ricardo Terra, UFMG, Brazil

Roberto Affonso Costa Júnior, UNIFEI, Brazil

Sanderson Lincoln Gonzaga de Oliveira, UFLA, Brazil

Valter F. Avelino, USP, Brazil

Victor H. C. Albuquerque, FEUP, Univ. do Porto, Portugal

Vitus S. W. Lam, Hong Kong University, China

Alexandre Francisco, UFF, Brazil

Alvaro Coêlho, UESC, Brazil

André Luiz Zambalde, UFLA, Brazil

Anita Fernandes, UNIVALI, Brazil

Antonio Pedro Timoszczuk, USP, Brazil

Arnaldo de Albuquerque Araújo, UFMG, Brazil

Carlos Passos, CTI/MCT, Brazil

Danton Diego Ferreira, UFLA, Brazil

Eder Mateus Nunes Gonçalves, FURG, Brazil

Fábio Levy Siqueira, USP, Brazil

Fatima L. S. Nunes, USP, Brazil

Heitor Augustus Xavier Costa, UFLA, Brazil

Ilda Reis, FEUP, Universidade do Porto, Portugal

Ilija Basicovic, University of Novi Sad, Serbia

Janine Knies, UDESC, Brazil

Johan M. Sharif, Swansea University, UK

Jorge Rady Almeida Junior, USP, Brazil

Leonardo Ribeiro, UFLA, Brazil

Luiz Camolesi Jr., UNICAMP, Brazil

Luiz Eduardo G. Martins, UNIMEP, Brazil

Manuj Darbari, BBDNITM, India

Marco Tulio Valente, UFMG, Brazil

Maria Istela Cagnin, UFMS, Brazil

Mauricio Kischinhevsky, UFF, Brazil

Muthu Ramachandran, Leeds Metropolitan University, UK

Neumar Malheiros, UFLA, Brazil

O. P. Gupta, Punjab Agricultural University, India

Paulo Henrique de Souza Bermejo, UFLA, Brazil

Plínio Sá Leitão Júnior, UFG, Brazil

Reghunadhan Rajesh, Bharathiar University, India

Renato Ishii, UFMS, Brazil

Ricardo da Silva Torres, UNICAMP, Brazil

Rodrigo Fernandes de Mello, ICMC-USP, Brazil

Udo Fritzsche Jr., PUC Minas em Poços de Caldas, Brazil

Valter Vieira de Camargo, UFSCar, Brazil

Vimal Mishra, Uttar Pradesh Technical Education, U.P., India

Wiliam Soares Lacerda, UFLA, Brazil

**Technical staff:** Ariana da Silva Laureado.

Indexed in: **INSPEC; Qualis-CAPES.**

INFOCOMP – Journal of Computer Science – v.10, n.4 (2011) – Lavras: Universidade Federal de Lavras, 2011.

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

Sumários em Inglês

ISSN 1807-4545

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

**Solicita-se permuta / Exchange desired; tiragem / circulation: 250.**