

UPGRADE is the European Journal for the Informatics Professional, published bimonthly at <<http://www.upgrade-cepis.org/>>

#### Publisher

UPGRADE is published on behalf of CEPIS (Council of European Professional Informatics Societies, <<http://www.cepis.org/>>) by *Novática* <<http://www.ati.es/novatica/>>, journal of the Spanish CEPIS society ATI (*Asociación de Técnicos de Informática*, <<http://www.ati.es/>>)

UPGRADE monographs are also published in Spanish (full version printed; summary, abstracts and some articles online) by *Novática*

UPGRADE was created in October 2000 by CEPIS and was first published by *Novática* and **INFORMATIK/INFORMATIQUE**, bimonthly journal of SVI/FSI (Swiss Federation of Professional Informatics Societies, <<http://www.svifi.ch/>>)

UPGRADE is the anchor point for UPENET (UPGRADE European NETWORK), the network of CEPIS member societies' publications, that currently includes the following ones:

- **Informatik-Spektrum**, journal published by Springer Verlag on behalf of the CEPIS societies GI, Germany, and SI, Switzerland
- **ITNOW**, magazine published by Oxford University Press on behalf of the British CEPIS society BCS
- **Mondo Digitale**, digital journal from the Italian CEPIS society AICA
- **Novática**, journal from the Spanish CEPIS society ATI
- **OCG Journal**, journal from the Austrian CEPIS society OCG
- **Pliroforiki**, journal from the Cyprus CEPIS society CCS
- **Pro Dialog**, journal from the Polish CEPIS society PTI-PIPS

#### Editorial Team

Chief Editor: Llorenç Pagés-Casas, Spain, <[pages@ati.es](mailto:pages@ati.es)>

Associate Editors:

François Louis Nicolet, Switzerland, <[nicolet@acm.org](mailto:nicolet@acm.org)>  
Roberto Carniel, Italy, <[carniel@dtg.uniud.it](mailto:carniel@dtg.uniud.it)>  
Zakaria Maamar, Arab Emirates, <[Maamar@zu.ac.ae](mailto:Maamar@zu.ac.ae)>  
Soraya Kouadri Mostéfaoui, Switzerland, <[soraya.kouadrimostefaoui@unifr.ch](mailto:soraya.kouadrimostefaoui@unifr.ch)>  
Rafael Fernández Calvo, Spain, <[rfoalvo@ati.es](mailto:rfoalvo@ati.es)>

#### Editorial Board

Prof. Wolfgang Stucky, CEPIS Former President  
Prof. Nello Scarabottolo, CEPIS Vice President  
Fernando Piera Gómez and Llorenç Pagés-Casas, ATI (Spain)  
François Louis Nicolet, SI (Switzerland)  
Roberto Carniel, ALSI – Tecnoteca (Italy)

#### UPENET Advisory Board

Hermann Engesser (Informatik-Spektrum, Germany and Switzerland)  
Brian Runciman (ITNOW, United Kingdom)  
Franco Filippazzi (Mondo Digitale, Italy)  
Llorenç Pagés-Casas (Novática, Spain)  
Veith Risak (OCG Journal, Austria)  
Panicos Masouras (Pliroforiki, Cyprus)  
Andrzej Marciniak (Pro Dialog, Poland)  
Rafael Fernández Calvo (Coordination)

**English Language Editors:** Mike Andersson, Richard Butchart, David Cash, Arthur Cook, Tracey Darch, Laura Davies, Nick Dunn, Rodney Fennemore, Hilary Green, Roger Harris, Michael Hird, Jim Holder, Alasdair MacLeod, Pat Moody, Adam David Moss, Phil Parkin, Brian Robson

Cover page designed by RFCalvo, © Rafael Fernández Calvo 2006

Layout Design: François Louis Nicolet

Composition: Jorge Llácer-Gil de Ramales

Editorial correspondence: Llorenç Pagés-Casas <[pages@ati.es](mailto:pages@ati.es)>

Advertising correspondence: <[novatica@ati.es](mailto:novatica@ati.es)>

UPGRADE Newslist available at

<<http://www.upgrade-cepis.org/pages/editinfo.html#newslis>>

#### Copyright

© Novática 2006 (for the monograph)

© CEPIS 2006 (for the sections MOSAIC and UPENET)

All rights reserved under otherwise stated. Abstracting is permitted with credit to the source. For copying, reprint, or republication permission, contact the Editorial Team

The opinions expressed by the authors are their exclusive responsibility

ISSN 1684-5285

Monograph of next issue (October 2006)

### "Web Services"

(The full schedule of UPGRADE is available at our website)

### 3 From The Editor's Desk

UPGRADE: A Project for The Current Day and Age

### Monograph: The Bologna Process and The Informatics Profession (published jointly with Novática\*)

Guest Editors: *Juan-José Cuadrado-Gallego, Luigi Buglione*

### 4 Presentation. The Bologna Process and The Informatics Profession — *Juan-José Cuadrado-Gallego, Luigi Buglione*

### 7 Professionalism in IT — *Charles Hughes*

### 11 Towards A Real Change (or The Modification of Computer Engineering Studies through The Eyes of A Student) — *Mikel Salazar-Peña*

### 13 Evolution of Computer Science Studies in Spain in The European Higher Education Area — *Juan-José Cuadrado-Gallego, León González-Sotos, Daniel Rodríguez-García, Miguel-Ángel Urban-Sicilia*

### 22 Bologna Process: The Italian Experience — *Luigi Buglione*

### 27 The Dutch Experience of Carrying Out the Bologna Process — *Maya Daneva*

### 34 Historical Evolution of Courses of Study in Computer Science: A German Experience Report — *René Braungarten, Martin Kunz, and Reiner R. Dumke*

### 45 ECTS Pilot Scheme for the Technical Engineering Degree in Data Processing and Computer Systems — *José Luis Álvarez-Macías, Manuel J. Redondo-González, Javier Aroba-Páez, Beatriz Aranda-Louvier, Patricio Salmerón-Revuelta*

## UPENET (UPGRADE European NETWORK)

### 53 From **Pro Dialog** (PTI-PIPS, Poland)

Human-Computer Interface

High Performance Computing Technology, Applications and Business — *Maksymilian Cierniewski, Jan Kniat, Pawe Marciniak, Marcin Zduniak, and Micha Zygmunt*

### 66 From **Novática**

ICT Security

Anatomy of An Intrusion

*Miguel Sánchez-López*

\* This monograph will be also published in Spanish (full version printed; summary, abstracts, and some articles online) by *Novática*, journal of the Spanish CEPIS society ATI (*Asociación de Técnicos de Informática*) at <<http://www.ati.es/novatica/>>.

From The Editor's Desk

## UPGRADE: A Project for The Current Day and Age

Dear Readers:

As the President of CEPIS announced in his editorial two months ago, as of this issue I am joining **UPGRADE** as chief editor. I do so with high hopes and great expectations, and the firm intention to continue to help this project grow, a project that is about to enter into its seventh year.

It is truly satisfying to see how **UPGRADE** has become established as a benchmark European publication in the field of computer science, ever since in late 2000 CEPIS's board first decided to publish the journal, and **François Louis Nicolet** and **Rafael Fernández Calvo** took responsibility for its launch, publication, and promotion. Its success is evidenced by the growing number of visitors to the journal's online content and the more than 2,000 subscribers to the "**UPGRADE Newsletter**" which was launched in 2003.

To work in **UPGRADE** is to work with the deck stacked in your favour, for two basic reasons:

- a) The intrinsic need for IT professional to recycle their knowledge.
- b) The reality of an ever more united Europe, where old borders are becoming increasingly more blurred, especially in terms of the economy and the transfer of knowledge and technology.

When I embarked on my career 30 years ago in a major multinational pharmaceutical firm, all the company's data processing was handled by a computer with two 64Kb partitions, which occupied a huge refrigerated room. Programming was a purely artisan process and the source storage medium was the punch card.

Since then the evolution of computer science has been, and still is,

meteoric, to such an extent that in a mere 2-3 years a professional's knowledge can become obsolete and he or she will run the risk of ending up "on the scrap heap". That is why it is so important for professional organizations to provide their members with the best possible opportunities to recycle and renew their knowledge.

The second factor I mentioned is also of paramount importance. European projects are playing an increasingly prominent role, which is no wonder in a European Union that since May 1, 2004 boasts 25 countries and a total population of 460 million.

As chance would have it, the theme of this issue's monograph is the so-called "Bologna Process" which will finalize in 2010 with the European-wide standardization of university studies, allowing students to enjoy total mobility among the universities of the signatory states. Another step forward in the move towards an increasingly more fluid circulation of professionals and knowledge at a European level.

And this is where **UPGRADE** is up in the vanguard of these trends:

■ Because one of the principal goals of our online journal is, and will continue to be, to keep our European readers up to date with the latest IT trends by means of the dissemination and exchange of new knowledge and professional best practices and experiences.

■ Because professionals from all over Europe work, and will continue to work, on each issue of **UPGRADE**. We strive to include the most representative contributions from the best specialists in Europe in each of our monographs, and in the articles that go into our **UPENET** (**UPGRADE** European Network) section. In this section we republish, in English, articles from

that network of journals, currently made up of seven publications representing eight different countries.

To conclude, I would like to give my sincerest thanks to the outgoing chief editor of **UPGRADE**, **Rafael Fernández Calvo**, for volunteering to take on the job, on a temporary basis, of coordinator of **UPENET** and editor of that section of **UPGRADE**. This will make the transition period that any handover of responsibilities entails that much more trouble-free, easy, and effective.

As ever, your comments, suggestions, and criticisms will always be welcome.

Yours sincerely,

**Llorenç Pagés-Casas**  
Chief Editor, **UPGRADE** and **Novática**  
<pages AT ati DOT es>