REV2007 Special Focus Issue

J. M. Martins Ferreira
University of Porto (FEUP / DEEC), Porto, PORTUGAL
REV2007 Conference Chair

Broadband communication networks and the internet are already intrinsic to the work paradigm of many industry manufacturers and service providers, and particularly to engineering activities. E-learning and remote laboratories are by now common in most universities, while many multinational high-tech companies rely on distributed engineering teams that share highly sophisticated manufacturing facilities located worldwide.

This vision guided the preparation of the International Conference on Remote Engineering and Virtual Instrumentation (REV'07), which was held in Porto, Portugal, on June 25-27, 2007. In response to its call for papers to discuss the state-of-the-art and future trends in multiple areas of Online Engineering, REV'07 received contributions from 22 countries in 5 continents. In this special issue of the International Journal of Online Engineering, we offer to our readers a selection of those papers, submitted by academic and industry researchers.

The 9 papers selected for publication cover a wide application range, which largely reflects the main areas where online engineering (OE) became increasingly important in recent years. Broadly speaking, OE provides solutions for sensing remote data, in cases where the interaction requirements are minimal, or for sensing and controlling remote processes. Both types may be found in educational and industrial applications. Time scale and geographical distribution provide further classification criteria. OE solutions may be preferable by being able to compress or extend the application time scale, because they are the only feasible solution to access very remote equipment, or simply because the engineering offices offer more comfort than the factory shop floor. Last but not least, accessibility requirements are at the forefront of applications development in this area as well, and as such are also represented in this selection.

REV2007 Best Paper

Zorica Nedic and Jan Machotka won the REV07 Best Paper Award with their work entitled Remote Laboratory NetLab for Effective Teaching of 1st Year Engineering Students. This paper shares their experience with a remote lab developed to support experiments in electrical engineering courses at the University of South Australia (UniSA). The authors also offer their view on how to design remote labs and discuss the benefits, teaching practices, and their integration into 1st year students curricula.

Education

Online labs remain one of the main application areas of OE techniques. Federico Lerro and Mauro Protano from the Faculty of Exact Sciences in Rosario, Argentina, present their low-cost, thin-client "Web-based Remote Semiconductors Devices Testing Laboratory", which enables the students to analyse the behaviour of basic electronic components, namely diodes, BJT, J-FET, and phototransistors.

In their paper entitled "Remote Laboratory Hardware Modules Based on Networked Embedded Systems", Darko Fuduric, Mario Zagar et al. describe their embedded systems open remote laboratory to support introductory microcontroller courses.

Recognising the importance of teaching PID control techniques at undergraduate level, Victor Silva and his colleagues, from the University of Minho in Portugal, present a remote experiment where an algorithm programmed in LabView enables the students to perform "Remote PID Control of a DC Motor".

Contributing with a paper entitled "A Smart Layer For Remote Laboratories", Ricardo Costa and his colleagues from the Polytechnic Institute of Porto describe how a JAVA API and the KNX home systems protocol may be combined to facilitate the development of weblabs with enhanced power saving and easier control of the physical space.

Industry

(Tele)Robotics is a classic example of OE sensing and controlling applications. In their paper entitled "Programming industrial robots using advanced input-output devices: test-case example using a CAD package and a digital pen based on the Anoto technology", Roberto Pires et al. present their proposal to simplify robot programming tasks, based on the use the digital pen and paper from Anoto as input devices. Their work is particularly directed towards the needs of manufacturing SMEs and aims to create simpler and more user friendly alternatives for programming, parameterization and commanding actions.

Reinhard Langmann's paper "Web-based Operation of Mass Flow Rate Measuring Instruments", describes the concept of Lean Web Automation, which was developed in the University of Applied Sciences in Dusseldorf, Germany, and explains how it was used to support the distributed and web-based operation of mass flow measuring instruments. For those readers that may not be aware of this fact, I take this opportunity to inform that Reinhard and his team will be the organisers of REV'08, which will take place in Dusseldorf on June 23-25.

In their paper entitled "Remote access to expensive SDRAM test equipment: Qimonda opens the shop-floor to test course students", Ana Leão and J. M. Ferreira describe a successful case study of industry-university cooperation. Besides remote access to the university lab facilities, the EEC0060 Electronic Systems Test course

students are also able to access sophisticated test equipment located in the company's manufacturing plant.

Accessibility

Jim Harkin, Michael Callaghan and their colleagues from the Intelligent Systems Research Centre at the University of Ulster, present a remote experimentation environment that illustrates how to create appropriate interfaces which will enrich the learning experience of visual/audio impaired users. Their paper, entitled "Extending Remote Experimentation Environments to Support Visual and Audio Impaired Users", considers the implications of bringing together online lectures and lab experiments, and proposes solutions that offer benefits to a much wider application area.

To conclude this Guest Editorial, I would like to thank all REV'07 sponsors, and in particular **National Instruments** and **Agilent**. Their contribution as Gold Sponsors of this event assumed multiple forms and highly reinforced the liaison of the conference to the industry world.

J. M. Martins Ferreira, is with the Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal (e-mail: jmf@ fe.up.pt).