

VIRTUAL-LAB'2008 Special Issue

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Virtual and remote laboratories extend modern e-learning environments with practical training aspects in many fields such as computer sciences, natural sciences and electrical/mechanical engineering. Laboratory classes, which are an important part of engineering education, are often resource intensive. Virtual and remote laboratories provide an efficient way to reduce the required resources by providing remote access to a reduced number of real experiments or simulated replacements.

This special focus issue of the IJOE journal presents a best paper selection of the proceedings of the 2nd International Workshop on E-learning and Virtual and Remote Laboratories 2008 (VIRTUAL-LAB'2008), held at Hasso Plattner Institute in Potsdam, Germany on February 14-15, 2008. The workshop intended to focus and discuss the latest development in the area of remote and virtual laboratories. Among other topics the interconnections of heterogeneous laboratory infrastructures by using middleware has been in the centre of the workshop's discussions. As one result of the workshop Web service technology seems to be an appropriate technology for the interconnection of experiments and users.

Within this special focus issue 5 papers have been selected. The paper "A Virtual Laboratory for Digital Design" authored by Domenico Ponta and Giuliano Donzellini presents the virtual laboratory Deeds and concentrates on simulators and tools for teaching digital circuit design and computer architecture. Additionally the paper describes an example laboratory session.

"Tele-Lab IT-Security: an Architecture for an online virtual IT Security Lab" is a paper which describes Tele-Lab, a virtual laboratory for IT-security education. Beside its architecture, which relies on virtual machines, a web-based tutoring environment is presented. The paper has been written by Christian Willems.

Ingvar Gustavsson et al. present two online laboratory workbenches for electrical/mechanical experiments in the paper "A Flexible Instructional Electronics Laboratory with Local and Remote Lab Workbenches in a Grid". Among other topics this paper focuses on standards and

pedagogical aspects arising when connecting lab workbenches from different universities into a grid.

The paper "NeOS: Neuchâtel Online System" authored by Heiko Sturzrehm et al. presents an e-learning tool developed to support hands-on training experience. In addition the tool supports computer aided assignment evaluation. Its usage in operating system education is explained in detail. One major focus of the paper are security related topics.

Peter Tröger et al. present a laboratory infrastructure, the Distributed Control Lab, which uses Web services to interconnect physical experiment installations in the paper "SOA Meets Robots - a Service-Based Software Infrastructure for Remote Laboratories". Each experiment is abstracted as a service. Users can access the experiments using different Web service client applications relying on standardized XML-based messages.

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The editors would like to thank all authors for their excellent contributions and wish the readers of iJOE a fruitful and knowledge-gaining experience when reading this special focus issue.

Best regards,
Andreas Rasche and Bernhard Rabe.

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