Web Applications of Sensors and Measurement Laboratory

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Abstract: The contribution describes the web support of education at laboratory of sensors and measurement engineering. The presented applications are using in every specialist subjects of practice education in laboratory. These applications were created helping by scripted languages as php, java scripts and database server MySQL, Macromedia Flash environment, etc. Monitoring application was construct using by HTTP component at Control Web system. This type of applications are designed and implemented on department of control system and measurement and there are component of diploma thesis and dissertation work.

Keywords: web application, sensor and measurement laboratory

1 Introduction

The Sensor and Measurement Laboratory makes use of the hardware experimental modules and lab stands, interactive multimedia software suite (on Intranet/Internet environment), a specially written programme modules for experimental data presentation and processing, hardware/PC interface, comprehensive student guides and e-textbooks. The computers may be used to enhance the effectiveness of the learning experience through data acquisition and control software and also to extend its interactive capabilities through use of the Web pages supplied (special Sensor and Measurement Laboratory portal http://352lab.vsb.cz).

2 Student’s cooperation on web application

The students cooperate on the production of software support, especially on web support at their diploma thesis, mainly on applications for utilization at the subjects as automation or measurement and sensors engineering. These diploma works are after their finishing immediately plugged into education process. The advantage is presentation of domain subjects as well as department of Control Systems & Instrumentation, but also these application are using at large at the exercise of subjects mentioned above. However decided advantage for diploma students is also interconnection of domain automation engineering and applied informatics. So students are using in the course of production of diploma works their know-how from wide range domain subjects of their study.

Figure 1: presentation of Sensor and Measurement Laboratory
3 Multimedia presentation of laboratory

The first application in presentation describes the multimedia presentation of laboratories at the department. Students are introduced to the subject Programming of applications for the web and various techniques and technologies for creating web applications. One of them is creating web applications in the Macromedia Flash environment. In sum of diploma thesis input was created the application with self executing CD, where are presented the particular laboratory workstations of Department of Control Systems & Instrumentation.

Macromedia Flash MX is a powerful Web authoring application used to create animation, interactive environments and data driven applications for use on Web sites. Flash MX is one of the leading Web authoring programs for creating vector-based animations or "Flash movies" for Web sites.

Flash MX supports the importing of bitmap graphics. This feature gives the Web developer a great deal of flexibility. The addition of a Flash movie to a Web site invites interactivity and provides an opportunity for visitors to have a more engaging experience. This Macromedia flash application contains presentation intro, animated control elements for navigating and moving at the presentation. Application is complemented with datasheet for fundamental of using Macromedia Flash environment.

4 Web support of sensors laboratory

In Sensors and Measurement Laboratory proceed the educations of several subjects of corresponding area. The application for support of this education was developed on Department CSI. This application module contains description of all working place, complete with instruction and code of practice and the order plan of the measurement.

On the next Figure 3 we can see the main window of the application web module. There is panoramic view of the Sensors and Measurement Laboratory. Helping by mouse movement on particularly working place are showing the concrete laboratory exercise with
the title of particularly tasks. After the selection of concrete task we can see the input manual for laboratory exercise. Input manual includes progress of measurement, description of using devices and schematic diagram.

Furthermore among other thing also theoretical analysis, mathematical equation and the preparing template of the table for measured values. This application module disposed of the problems growing with distribution of manual input for students, material charges and time expenses. The mentioned application is of course variable and the able to complete and upgrade

![Laboratory Měřicí a senzorové techniky H306](image)

Figure 3 – Web Education Pages for support of Sensors and Measurement Laboratory.

5 On line attendance and evaluation

PHP is a server-side scripting language and interpreter that is available on a wide range of platforms, including some versions of Apache, and Microsoft's Internet Information Server (IIS). The original program was called Personal Home Page Tools, which is where the initials PHP come from. There are also a few other definitions of the name, mostly thought up in retrospect. Some say that PHP is a recursive three letter acronym meaning, PHP Hypertext Pre-processor. Another generally accepted definition is Pre Hypertext Processor. The PHP script is embedded in the Web page, and interpreted on the server before being sent to the client who requested the page. PHP is open source, and may be downloaded from www.php.net. The MySQL (R) software delivers a very fast, multi-threaded, multi-user, and robust SQL (Structured Query Language) database server. MySQL Server is intended for mission-critical, heavy-load production systems as well as for embedding into mass-deployed software. Users can choose to use the MySQL software as an Open Source/Free Software product under the terms of the GNU General Public License (http://www.gnu.org/licenses/) or can purchase a standard commercial license from MySQL AB.
Next application is created at PHP scripted language with SQL server support. This application supports the education at laboratory of sensors and measurement is application program module of attendance and evaluation. This application module removes the using of attendance list on paper and makes easy the tutor checking system of attendance and the credit giving.

This application also enables the evaluation of students during semester. Student is evaluated for delivered protocols from the exercise – measurement of particular task and credit project. Of course the evaluation listed above is possible to fill into web application.

![Web timetable and list for evaluation and the attendance checking.](image)

The administrators of this application are the tutors, which gives lessons at these laboratories. The tutor must fill appropriate web form for creating of concrete attendance list at the beginning of term. Application is user friendly and has intuitive commands. There is updated a timetable of the tutor, after the generating of attendance list. (see the Figure 6).

The Attendance list of study group is shown after the clicking on particular subject. The tutor of the exercise practice fills the name of students. For the attendance is prepared 14 boxes (number of weeks of the term), another boxes are available for evaluation through the term. Student’s acquired points are automatically adding up, so it can be seen actual state of point’s evaluation. Of course the students may watch on these pages their results.

6 Conclusions

The contribution describes the web support of education at Sensors and Measurement Laboratory. The presented application program modules are using in every specialist subjects of practice education in laboratory. These applications were created helping by scripted languages as PHP, java scripts and database server MySQL and Macromedia Flash environment. This type of applications are designed and implemented on department of control system and measurement and there are component of diploma thesis and dissertation work. The presented results have been obtained with the support of the Czech Ministry of Education, Youth and Sports, during completing research project MSM 272300012.

7 References