

T5_13 THE FISL@BS PORTAL: A NETWORK OF VIRTUAL AND REMOTE LABORATORIES FOR PHYSICS EDUCATION

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The FisL@bs portal constitutes a distributed network of remote and virtual laboratories for science physics education via Internet. This network will be distributed among different Spanish universities. Using the same structure as the AutomatL@bs project (a network of virtual and remote laboratories for learning/teaching of control engineering, which is operative from 2 years), FisL@bs offers students the possibility to realize hands-on experiences in different fields of physics in both a real but remote way and in a simulated way. This paper gives an overview about how this portal works and the hardware and software tools used to create it. One of these tools is a Web-based learning environment (eMersion) which facilitates the deployment of pedagogical scenarios and learning resources for Web-based experimentation in education. As part of the FisL@bs project, several laboratories are being developed: a Snell's law refraction experiment, a motorized optical bench for the determination of the focal length of a thin lens, or a sensor whose XY position can be remotely controlled to measure the distribution of potential over a resistive sheet of paper with different electrostatic fields. One of the experiments already operative at the time of writing this paper is the one used to discover and verify Hooke's law. In this paper, the simulated experience is briefly described but a detailed description of the real assembly and the remote control and experience is given. This laboratory is accessible for anyone with an Internet connection and a Java compatible web browser. In order to reduce costs and give a user friendly impression to students, the Hooke's law experiment was built using Mindstorms Lego's pieces. The NXT brick from Lego lets a computer (via USB or Bluetooth) to control the motors and read the sensors connected to this brick. The real-time software that carries out these tasks is made up with LabView while the GUI to remotely experiment with this laboratory is a Java interface created with Easy Java Simulations (EJS): an authoring tool written in Java that helps to create interactive simulations in Java, mainly for teaching and learning purposes.