

ICTP – [The Abdus Salam International Centre for Theoretical Physics](#), Trieste, Italy

smr1335/Announcement

WORKSHOP ON DISTRIBUTED LABORATORY INSTRUMENTATION SYSTEMS

26 November - 21 December 2001

Miramare, Trieste - Italy.

The Abdus Salam International Centre for Theoretical Physics (ICTP) will organize a Workshop on Distributed Laboratory Instrumentation Systems, to be held at ICTP from 26 November to 21 December 2001. Professors Abhaya S. Induruwa (at present University of Kent, Canterbury, UK) and C. Verkerk (ICTP, formerly CERN, Geneva, Switzerland) will jointly direct the Workshop.

I. PURPOSE, NATURE AND PROGRAMME

General Outline

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The Workshop aims at showing how the degree of automation of a typical physics laboratory can be improved by making use of modern technology, such as embodied in the Internet and the Java environment. During the Workshop a distributed system will be demonstrated, consisting of PCs interconnected through a Local Area Network and controlling a variety of measurement and data acquisition equipment. The equipment is implemented as embedded systems using microcontrollers. These embedded systems will be connected to the, network either through PCs acting as front end computers or through small dedicated Network Interface Computers (NIC). The other PCs will act as operator consoles allowing access to the equipment through programs with comfortable graphical user interfaces. These programs will be implemented in Java and will be accessible through WWW pages. A database will provide all necessary information on the distributed equipment.

Laboratory Work

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During the Workshop the participants will be asked to enhance the system. This work consists of several parts:

€Program embedded systems to accomplish specific measuring and/or data acquisition tasks on one hand, and to communicate over the network on the other. The communication can take place over a serial interface to the front end PC, which in turn is connected to the network, or else via a NIC (if these will be available in time to be usable for the Workshop). The communication over the network will use a standard, well defined protocol, (e.g. http) whereas the front end PC will make use of a simple home made "Remote Procedure Call" protocol to have specific tasks executed on the laboratory instrument.

€Design and implement Graphical User Interfaces to control the instrument and collect the measured data. This part of the work will make use of Java Beans.

€Declaration of the new device in the database.

A total of 75 hours of regular laboratory work are planned.

Lecture Programme
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The lecture program will be designed to introduce the participants to the different concepts and techniques underlying such a Distributed Laboratory Instrumentation System and to prepare them to accomplish their tasks in the laboratory sessions. A very condensed course on programming in Java will occupy the first part of the Workshop, together with a reminder of techniques used in embedded systems, with emphasis on real-time constraints. Other lectures will treat the underlying concepts and techniques: Object Oriented programming technique, Internet technology and protocols, client-server web-based data bases, design of server-based Web pages. In addition lectures are planned on selected topics in Embedded systems, Real-time systems, Data analysis and processing and in Instrumentation techniques.

Close to 60 hours are available for regular lectures.

II PARTICIPATION

The Workshop is addressed to physicists and engineers interested in implementing in their home institute systems similar to the one outlined above. The Workshop is open to scientists from all countries that are members of the United Nations, UNESCO or IAEA. The main purpose of the Abdus Salam ICTP is to help research workers from developing countries, but the Workshop is also open to graduate students and post-doctoral scientists from developed countries. Participants should preferably have completed several years of study and research after a first degree. The Workshop will be conducted entirely in English, therefore participants must have an adequate knowledge of that language.

Given the advanced nature of the Workshop, it is indispensable that participants have a solid knowledge of and experience in hardware interfacing, programming in the C language, and the Linux (or other Unix) operating system. Knowledge of the principles of Object Oriented Programming, Internet and WWW, and HTML would be an asset, as would be previous exposure to Java. A committee will select the participants on the basis of the technical questionnaire (attached to the Bulletin), to ascertain the suitability of the applicant. Applications which are NOT accompanied by a complete technical questionnaire will NOT be taken into consideration. Priority will be given to those scientists who will be able to immediately apply the acquired knowledge to their running or planned experiments or instrumentation. Scientists who participated in one of the previous ``Colleges on Microprocessor-based Real-time Systems in Physics'' are eligible for participation in the present Workshop and are encouraged to apply.

Due to budget limitations the number of participants will be strictly limited to 50. All participants are required to take part in all aspects of this activity for the entire duration of the Workshop.

The closing date for requesting participation is ALREADY OVER.

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