

Third Workshop on Distributed Laboratory Instrumentation Systems

22 November - 17 December 2004
Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics (ICTP) will organise the *Third Workshop on Distributed Laboratory Instrumentation Systems* from 22 November to 17 December 2004. Professors: Abhaya S. Induruwa (Canterbury Christ Church University College, UK), Carlos Kavka (Universidad Nacional de San Luis, Argentina) and Ulrich Raich (CERN, Geneva, Switzerland) will jointly direct the Workshop. Catharinus Verkerk (formerly CERN, Geneva, Switzerland) will act as local organizer.

General Outline

The Workshop aims at teaching how the automation of a typical physics laboratory can be improved by making use of features embodied in the Internet and the Java programming environment. During the Workshop a distributed system will be demonstrated, consisting of PCs interconnected through a Local Area Network and interacting with a variety of measurement and data acquisition equipment. The equipment is implemented as embedded systems using microcontrollers. These are connected to the network through small dedicated Network Interface Computers (NICs). The PCs will act as operator consoles allowing access to the equipment through suitably designed graphical user interfaces (GUIs). All programmings will be implemented in Java and a database will provide necessary information on the distributed equipment.

Lecture Programme (Approximately 60 hours)

The lecture programme has been 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. Presentations on Java, Embedded Systems, Internet Technologies, Server-based Web Pages and Graphical User Interfaces will form the core of the lecture programme. Topics on Real Time Systems, Object Oriented Programming, Instrumentation, and Data Analysis and Processing will supplement the above.

Laboratory Work (Approximately 75 hours)

During the Workshop the participants will enhance the installed system by progressively developing software components. This work consists of several parts:

- ★ Programme embedded systems to accomplish specific measuring and/or data acquisition tasks on one hand, and to communicate over the network on the other. The measurement devices can either be attached directly to a NIC's standard I/O interfaces (e.g. one-wire devices) or be implemented by embedded systems that connect to the NIC via a simple serial protocol over an RS232 connection. The communication over the network will use a standard, well defined protocol (e.g. http).
- ★ Design and implement GUIs, using the Java-Swing GUI toolkit and Java Beans, to control the instrument and collect the measured data.
- ★ Implement, using MySQL, the database administration needed to register new devices and to perform data logging.

Participation

The Workshop is open to physicists and engineers from all countries that are members of the United Nations, UNESCO or IAEA and interested in implementing in their home institute, systems similar to the one outlined above. The principal objective of the Abdus Salam ICTP is to help researchers from developing countries. However 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 and must have an adequate knowledge of English as the Workshop is conducted entirely in 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 "Request for participation"), to ascertain the suitability of the applicant. Applications NOT accompanied by a duly completed technical questionnaire will NOT be considered.

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 8 July, 2004.

As a rule, travel expenses of the participants should be borne by their home institutions. However, limited funds are available for scientists from developing countries who will be selected by the organizers. As scarcity of funds allows travel to be granted only in a few exceptional cases, every effort should be made by candidates to secure support for their airfares (or at least half-fare) from their home country.

Requests for participation

There is no registration fee for attending the Workshop. The "Request for Participation" form is obtainable via the Web server: <http://agenda.ictp.trieste.it/agenda/current/fullAgenda.php?email=0&ida=a0373> it should be completed, signed and returned to the address below, together with the completed technical questionnaire. If sending an application by e-mail, please save and send file attachments in RTF format. Applicants are encouraged to interactively fill out their form on-line.

Third Workshop on Distributed Laboratory Systems
(c/o Elizabeth Brancaccio)
the Abdus Salam International Centre for Theoretical Physics
Strada Costiera 11
34014 Trieste, Italy

Telephone: +39-040-2240284 Telefax: +39-040-224163
E-mail: smr1594@ictp.trieste.it
ICTP Home Page: <http://www.ictp.trieste.it/>

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DIRECTORS:

Abhaya S. Induruwa
(Canterbury Christ Church
University College, UK)

Carlos Kavka
(Universidad Nacional de San Luis,
Argentina)

Ulrich Raich
(CERN, Geneva, Switzerland)

Local organizer:

Catharinus Verkerk
(Formerly CERN, Geneva,
Switzerland)

DEADLINE
for requesting participation

8 July 2004