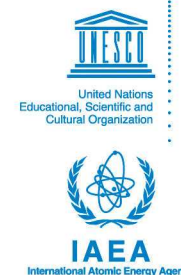




# The Abdus Salam International Centre for Theoretical Physics



## First Regional Workshop on Distributed Embedded Systems with Emphasis on Open Source

30 July - 17 August 2012  
Kampar - Malaysia

The Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy) and Universiti Tunku Abdul Rahman (UTAR, Malaysia) are jointly organizing the **First Regional Workshop on Distributed Embedded Systems with Emphasis on Open Source**, to be held at the UTAR Perak Campus at Kampar, Malaysia from 30 July to 17 August 2012. Professors: Abhaya Induruwa (Canterbury Christ Church University, UK), Carlos Kavka (ESTECO Srl, Trieste, Italy), Ulrich Raich (CERN, Geneva, Switzerland) will jointly direct the Workshop. Drs Maria Liz Crespo and Andres Cicuttin of the ICTP Multidisciplinary Laboratory (MLab) will act as ICTP Organizers. Professor Lee Sze Wei (UTAR, Malaysia) and Dr Ang Chu Suan (MMM Technology, Malaysia) will take responsibility for the local organisation of the Workshop.

The objective of the Workshop is to impart knowledge and develop skills needed to design and build small to large scale distributed measurement and monitoring instrument environments based on freely available Open Source technologies. The Workshop aims to teach how to reduce the development time by using Open Source Frameworks that allow quick and easy customisation to meet individual requirements. The recent introduction of smart phones and tablets has opened up possibilities hitherto not available for people in general, and scientists in particular, in developing countries. Among the smart phones and tablets in the market today Android is an open source platform and this Workshop aims to exploit their capabilities to implement instrument and measurement systems for physics and other experiments. It is also the objective of the organizers to create a community of experimental scientists in developing countries with the necessary skills and willingness to contribute to a much wider scale and long term data collection/management experiment with ICTP as the main focus that would help to build a repository of data pertaining to a number of areas that are of immediate interest to scientists around the world.

### Lecture Programme (Approximately 30 hours)

The lecture programme is designed to introduce the participants to the current status of open source software platforms (GNU/Linux, Real-Time Operating Systems, Software Development Platforms); state-of-the-art in Embedded System Hardware for distributed applications; networking technologies for instrumentation (Internet, LAN, Wireless Sensor Technology, Web Services); distributed data collection, processing and management (MySQL databases); and Android platform (hardware, software and applications).

### Laboratory Work (Approximately 75 hours)

In the first two weeks approximately 40 hours will be spent in directed laboratory sessions. About 35 hours in the third week will be spent in building an integrated instrument system.

Topics covered in the directed laboratory sessions include:

- Hands-on Open Source Software;
- Web Technology and Web Services for distributed applications;
- Working with small, medium and large embedded systems;
- Android tablets as an instrument platform;
- Networking of embedded systems for communication between them;
- Data collection and processing using open software;
- Distributed data management using open software (MySQL).

The core areas covered in the integration phase include:

- small scale distributed intelligent sensors and medium sized data concentrators;
- high end data repositories/ processing machines;
- distributed communication through the Internet using wireless and wired technologies;
- applications in environmental monitoring;
- processing and management of data; and distribution of data/results using WWW or Web Services technologies.

During the Workshop ample opportunities will be provided to the participants to present/discuss completed, ongoing or planned work in subject areas related to this workshop. It is hoped that this will stimulate further discussions and provide opportunities for intelligent interaction and long term commitment among the participants and the ICTP.

### PARTICIPATION

Applicants from countries in Asia Pacific that are members of the United Nations, UNESCO or IAEA may attend. As the Workshop will be conducted in English, participants should have an adequate working knowledge of this language. Unfortunately no funds are available to support participants, except for board and accommodation. Such support is available only to those attending the entire activity. **There is no registration fee.**

### HOW TO APPLY

The application form can be accessed at the activity website: <http://agenda.ictp.it/smr.php?2434>

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit online the application form **not later than 25 May 2012**. Recommendation letters are not mandatory, but may help you in the admission process.

Secretariat: Ms. Federica Delconte e-mail: [smr2434@ictp.it](mailto:smr2434@ictp.it) phone: +39-040-2240-9932; fax: +39-040-2240-7932  
Workshop's web page: <http://agenda.ictp.it/smr.php?2434> ICTP Home Page: [www.ictp.it](http://www.ictp.it)

April 2012



Universiti Tunku Abdul Rahman (UTAR), was established in August 2002 under the UTAR Education Foundation. UTAR is a dynamic University with four thriving Campuses - three in Klang Valley and one in Kampar, Perak.

Perak Campus, which sits on a 1300-acre piece of land donated by the Perak State Government, is 190 km or a two-hour drive from Kuala Lumpur. Flanked by picturesque mountains, dotted with scenic lakes and located within a growing township, Perak Campus offers a conducive, environment-friendly and community-fostering setting that enhances and fulfils the learning, teaching, research, and social needs of students and staff. The Campus currently hosts five faculties, an institute and a centre for foundation studies and serves over 12,000 students pursuing 46 programmes that includes 5 Doctorate, 7 Master's, 32 Bachelor's (Honours) and 2 Foundation programmes.

### DIRECTORS:

**A. INDURUWA (UK)**

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### ICTP ORGANIZERS:

**M. L. CRESPO**

**A. CICUTTIN**

### LOCAL ORGANIZERS IN MALAYSIA:

**S. W. LEE**

**C. S. ANG**

### APPLICATION DEADLINE

**25 MAY 2012**