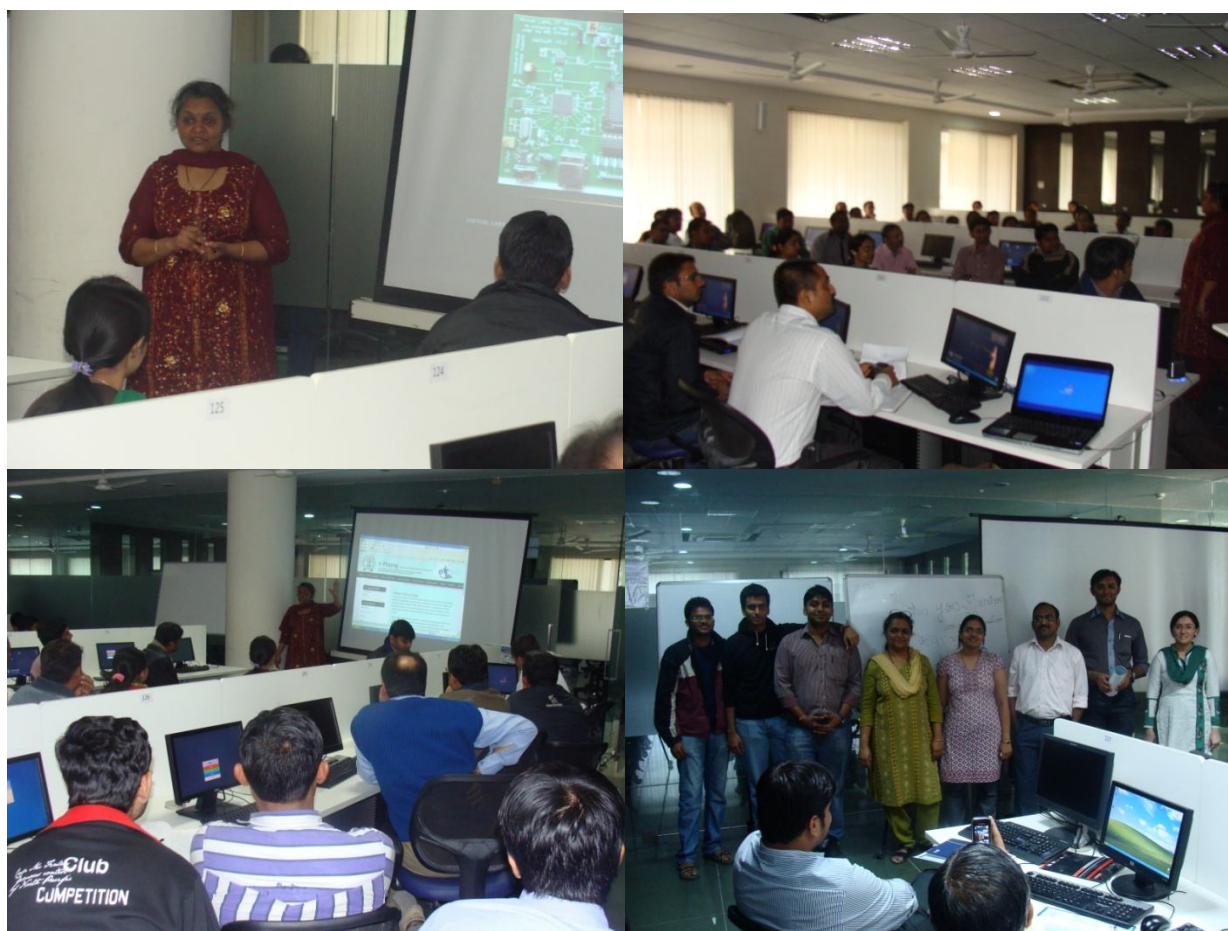# Two-Day Workshop on Virtual DSP Lab & Reconfigurable Hardware

Workshop Report
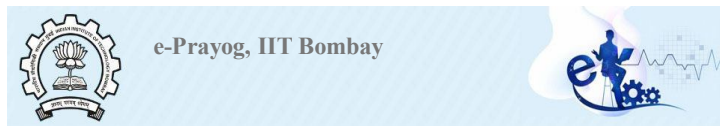
Jointly organized by

e-Prayog, IIT Bombay and Marwadi Education Foundation, Rajkot

December 23-24,2011

Marwadi Education Foundation, Rajkot

e-Prayog, IIT Bombay

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Workshop Overview

With rapid development in digital computers, digital signal processing and programmable logic devices has emerged as a viable alternative to analog ans digital signal processing. Recognizing this trend in technology, concept of reconfigurable hardware and DSP was introduced in the University curriculum at the UG/PG levels.

However, in most engineering colleges in India, it is being taught mainly as a theory course. The laboratory component, if any, mainly contains Matlab tutorials/assignments. Students do not often get an opportunity to work on actual processors. With the virtual DSP lab hosted in the Wadhwani Electronics Lab, we plan to provide educational support to all students who want to learn DSP as a subject and also the associated hardware.

Though some universities are already on the path to improve the teaching facilities, a first course in digital logic design has been a challenge mainly due to scaling up of the laboratory facilities at UG level. Hence, apparently in most of the institutes students are left with simulation using CAD/development tools without having any hands on experience with such devices. The Wadhwani Electronics Lab team provides a low cost solution to teach concepts of digital design using a CPLD with minimal requirements on the student's part.

To provide Hands on experience on facilities provided by Wadhwani Electronics Lab, Two-Day Workshop on Virtual DSP Lab & Reconfigurable Hardware was Jointly organized by e-Prayog, IIT Bombay and Marwadi Education Foundation, Rajkot at Marwadi Education Foundation Campus, Rajkot on December 23-24, 2011.

The primary objectives of workshop on Virtual DSP lab are

➢ To complement the theory course in Digital Signal Processing.
➢ To help students understand concepts through simple animations.
➢ To strengthen their understanding by
   • Trying out simulations using Scilab.
   • Remote triggering of experiments which are physically located at IIT Bombay
   • Learning assembly level programming with a low-cost DSP board designed at IIT Bombay

The primary objectives of workshop on Virtual DSP lab are

➢ To help the students to better understand the concepts of logic design
➢ To complement one semester theory course in digital design
➢ To give the students hands on experience with the process of reconfigurable logic design, implementation and verification of logic systems using modern designing tools for digital logic design using an affordable CPLD board designed at WEL Lab
➢ To make the student confident to use state of art technology

   In order to achieve above objectives, engineering faculties with experience in DSP and Reconfigurable Hardware were invited to attend this workshop from different engineering institutes in Saurashtra region (Gujarat).

Workshop Agenda

Day-1		
December 23, 2011		
09:30 am	Registration	
10:00 am	Breakfast	
10:00 am	Introduction to Virtual Lab, IIT Bombay	
12:00 am	Lunch	
Parallel Sessions		
	Virtual DSP Lab	**Reconfigurable Hardware**
12.30 pm	Introduction to Scilab	Introduction to Reconfigurable Design
3:15 pm	Hightea	
03.30 pm	Lab session on Scilab	Lab session on simulation using Quartus II
Day-2		
December 24, 2011		
09:00 am	Breakfast	
09:30 am	Filter implementation using Scilab & C	Implementation of design on Helium board
01:30 pm	Lunch	
02.00 pm	Filter implementation using remote lab facility	Demo of FPGA/PIC development board
04:30 pm	Hightea	
05:00 pm	Closing ceremony	

Teaching Faculty

e-Prayog Team, EE Dept, IIT Bombay.

1.	Madhumita Date	Project Manager, Virtual Lab, IIT Bombay
2.	Mahesh Bhaganagare	Technical Superintendent, IIT Bombay
3.	Abhishek Kamath	Research Associate, IIT Bombay
4.	Arpita Agrawal	Research Associate, IIT Bombay
5.	Srinivasa Rao	Research Associate, IIT Bombay
6.	Saurabh Agrawal	Project Engineer, IIT Bombay

Appendix One : List of participants

"Two day workshop on Reconfigurable Hardware"

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Appendix Two : List of participants

"Two day workshop on virtual DSP Lab"

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