

Tutorial Title: Hands-on Sessions on ARM Target

Context:

Billions of Microcontrollers are used every year in electronic market. Today, a similar size Microcontroller market is made up of applications such as Industrial Control, Metering and Measurement, Motor Control, Medical electronics and Consumer Appliances. The need for increased functionality and integration is driving the move from traditional 4 and 8 bit Microcontrollers toward the greater performance and flexibility provided by cost effective 32 bit designs.

Standardizing on a processor core and standard peripherals will help to manage the complexity, connectivity and compatibility of systems whilst decreasing the time and money spent during the development cycle. The ARM platform is one of the most widely used platform due to the following features:

- Reliability through mature, industry proven architecture
- Supply chain efficiency
- Cost reduction
- Core performance
- Tools of choice
- Wide support

There is a large number of professionals, across many disciplines – computer science, electrical engineering, electronics and communication engineering etc who are creating applications and solutions using the ARM platform

In our tutorial, we will try to introduce this platform and offer basic hands-on activities which will enable the participants to appreciate the features of the platform and get started to work with the tools and methods.

This tutorial will enable faculty members to get a live demonstration of different tools and methodologies of working with this platform. Students can take this opportunity and enhance their skill set thus ensuring better job prospects.

Agenda:

Introduction to ARM7 & IDE (Integrated Development Environment)

- What is ARM?
- Why ARM
- Introduction to GCC Compiler/IDE tool and CPU target
- Need of Structured programming using C

Hand-on with ARM7 Platform & Interfacing with basic peripheral

- Introduction to ARM7 Target Board.
- Writing basic programs using GCC compiler
- Interfacing LED, 16 x 2 Characters LCD, 7-Segment LED.

Debugging Techniques & Hand-on with RTOS (UCOS-II)

- Debugging using JTAG Debugger
- Brief Introduction to RTOS(UCOS-II)
- Implementing task switching using uCOSII **RTOS** on ARM7 Target Board using LCD & Matrix Keyboard

Introduction and Demonstration of ARM9 Target

- Introduction of ARM9 Target Board & Tool chain
- Brief Introduction to U-boot, Kernel & File System.
- Demonstrating of kernel configuration and Configuring Kernel for ARM9 Target Board
- Porting/Flashing Compiled Kernel on ARM9 Target

Demonstration of Image Processing Application using ARM9+DSP with DaVinci Platform

- Introduction to DaVinci Platform for Image processing.

- Demonstration of Image Capturing & Processing – Includes demonstration for:
 - Negative Image
 - Monochrome
 - Mirror
 - Histogram
 - Contrast
 - Brightness
 - High pass & Low pass Filters
 - SOBEL filters

Prerequisite for attendee:

- Knowledge of C language
- Basic knowledge of Linux is expected but not essential
- General knowledge of microcontroller, RTOS (not mandatory)

Lab Components:

- The CPU target kits will be provided by EduTech for necessary hands-on session.

Infrastructure Requirement:

- One Projector
- One PC between two participant
- PC requirement
 - Windows XP
 - CD-ROM
 - 512 RAM
 - 3 GB Hard disk space
 - Internet connection

Media of Tutorial Material:

- Source code and other related material for the hands-on session will be distributed to the participants
- ***We are also pleased to offer one user license of ARM-IDE (Costing 16,000/- Rs.) for every participant of the workshop.***

Presenter

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