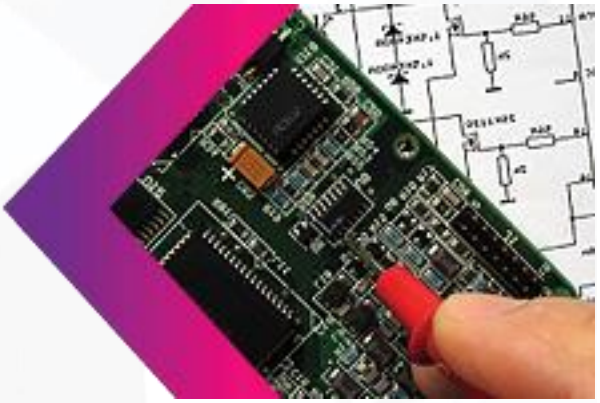
EMERTXE

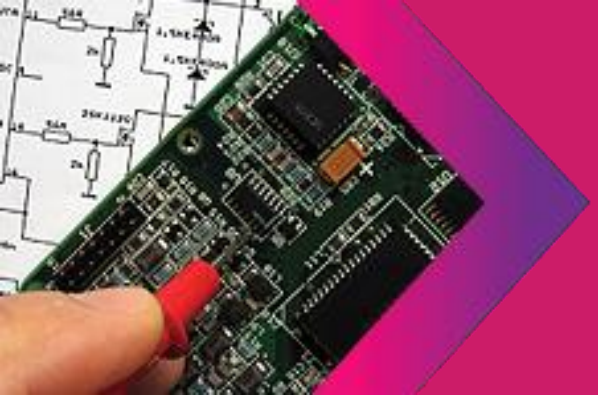
"Here to take you beyond"

ANDROID SYSTEM DEVELOPMENT

(Android HAL & device drivers)

Weekend Workshop





NOW FOR SIMPLIFIED SOLUTIONS

Android System Development - Weekend workshop

- **Objectives:**
  - ✓ Knowledge acquisition to integrate devices with Android platform
  - ✓ Get familiar with Android architecture to build perspective of integration
  - ✓ Deep dive into Android HAL subsystem for adding support for new devices
  - ✓ Get crystal clear understanding how Android and Linux system works together
  - ✓ Get hands-on with the Android and Linux kernel build environment

- **Overview:**

  Android system development workshop takes hands-on approach towards integrating new device into the Android system. There is a surge in number of new devices, primarily sensors, controllers and data loggers, getting connected under the umbrella of Internet-Of-Things (IoT). These devices need to be added into the Android system to present vital information to users for decision making and control. System designers must understand role and behavior of Android HAL, Android Services and Linux device driver ecosystem for smooth and efficient integration of new devices into Android platform.

  In summary, this unique course provides you necessary overall perspectives of both Android and Linux sub-systems so that you can seamlessly "hook" your new devices suitable for various applications (Medical, Automotive and Home to name few).

- **Duration:**

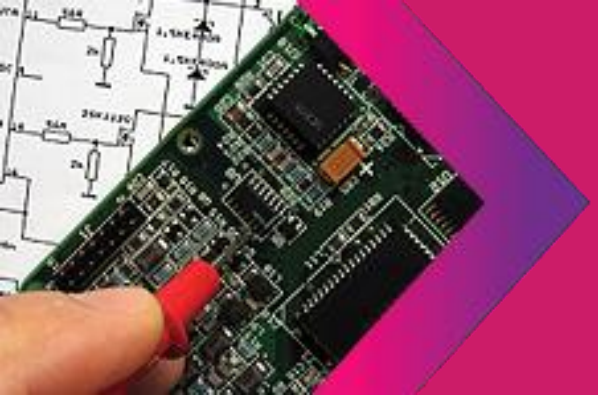
  4 days (Two weekends)

- **Platform:**
  - ✓ Ubuntu 14.04 LTS or higher 64-bit system workstation
  - ✓ Beaglebone black or Raspberry Pi target board
  - ✓ External camera and sensors
  - ✓ Android 6.0 (Marshmallow)

- **Delivery method:**

  Workshop based approach delivered in a fast-track

- **Pre-requisites:**
  - ✓ Good programming skills and proficient in C Language
  - ✓ Basic Linux Application programming (good to have)



- **Detailed course contents:**

Day-1:

- ✓ **Introduction to Android Architecture**
  - Understanding different layers and directory structure
  - Build Environment Setup
    - Android Source Code and Compilation
    - Bootloader
    - Android Build System

- ✓ **Linux Kernel**
  - Overview of Linux Driver Eco system
  - Kernel Configuration & Compilation

Day-2:

- ✓ **Linux device drivers**
  - Writing our first driver
  - Character Driver Interface
  - Adding a driver to kernel
  - Interfacing with real hardware
  - Audio Subsystem
  - Input and Event Subsystem

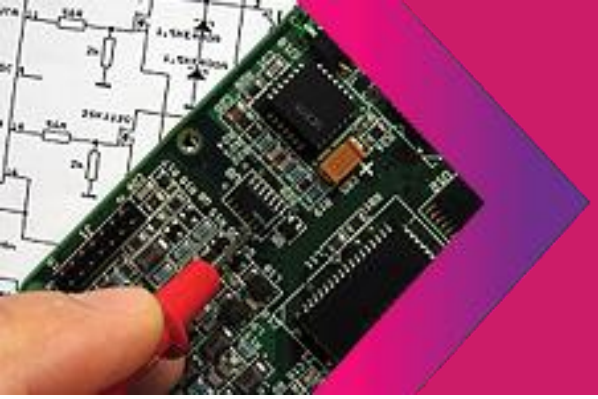
Day-3:

- ✓ **Video4Linux sub-system**
- ✓ **Android HAL – Overview**
  - Sensor HAL
  - Understanding data structures and APIs
  - Adding support for a new sensor
  - Writing test application for Sensor

Day-4:

- ✓ **Audio HAL**
  - Understanding data structures and APIs
  - Adding support for a new Audio device
  - Writing test application for Audio

- ✓ **Camera HAL**
  - Understanding data structures and APIs
  - Adding support for a new camera device
  - Writing test application for Camera



NOW FOR SIMPLIFIED SOLUTIONS

- **Hands-on session details:**
  - ✓ Install the tools required to compile Android
  - ✓ Compile and boot an Android kernel in the target board
  - ✓ Learning ADB :
    - Learn various ADB commands
    - Learn how to get the system log
    - Gain access to a shell on the device
    - Push and pull files
  - ✓ Add a new device to the build system
  - ✓ Understanding Linux Kernel's build system
  - ✓ Compiling Linux Kernel
  - ✓ Using bootloader commands to download android image and booting the target
  - ✓ Connecting Accelerometer
  - ✓ Connecting Gyro Sensor
  - ✓ Connecting Magnetometer
  - ✓ Audio playback and recording
  - ✓ Adding External Camera

- **Workshop Highlights:**

A unique course that helps you

- *Build expertise on Android HAL, Android Services and Linux device drivers eco system*
- *Build deep understanding of Android HAL and its hooking points for devices*
- *Integrate a device driver into Android platform*
- *Setup Android build environment*
- *Learn how to boot your Android device in an embedded target*
- *Get understanding of Linux device driver ecosystem*

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