EG-M42 Software for Smartphone: **Overview of Android**

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Outline

- Introduction
- Android Architecture
- Building Apps
 - Workflow
 - Development Environment
 - Android Development Tools (ADT)
 - Android Studio
 - MIT App Inventor
- Examples



What is Android?

- A Linux-based operating system from Google
 - Designed primarily for touchscreen mobile devices like smartphones and tablet computers.
- Open source in nature
 - The code is released under the Apache License which allows the software to be freely modified and distributed by device manufacturers, wireless carriers, as well as individual users.



Milestones

- October 2003
 - Android Inc. founded by Andy Rubin, Rich Miner, Nick Sears, & Chris White.
- August 2005
 - Google acquires Android Inc.
- 5 November 2007
 - Open Handset Alliance (OHA) Formed. Android Unveiled.
- 12 November 2007
 - Android Beta SDK Released.
- 23 September 2008
 - Android 1.0 Released. Featured on HTC Dream (G1).
- 9 February 2009
 - Android 1.1 update released for T-Mobile G1.

Version History by API Level

- Android 1.0 (API Level 1)
 - Released on 23/09/08.
 - 1st commercial version
- Android 1.1 (API Level 2)
 - Released on 09/02/09.
- Android 1.5 *Cupcake* (API Level 3)
 - Released on 27/04/09.
 - 1st release to officially use a code name based on dessert item.
- Android 1.6 *Donut* (API Level 4)
 - Released on 15/09/09.
- Android 2.0-2.1 *Eclair* (API Level 5-7)
 - Released on 26/10/09.
- Android 2.2-2.2.3 *Froyo* (API Level 8)
 - Released on 20/05/10.

- Android 2.3-2.3.7 *Gingerbread* (API Level 9-10)
 - Released on 06/12/10.
- Android 3.0-3.2 *Honeycomb* (API Level 11-13)
 - Released on 22/02/11.
 - 1st tablet-only update.
- Android 4.0-4.0.4 Cream Sandwich (API Level 14-15)
 - Released on 19/10/11.
- Android 4.1-4.3 Jelly Bean (API Level 16-18)
 - Released on 09/07/12.
- Android 4.4 KitKat (API Level 19)
 - Will be released in Oct./2013.



Android Architecture: Overview



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Android Architecture: Layers

- Applications
 - Written in java, executing in Dalvik virtual machine
- Application Framework
 - Services and libraries written mostly in java
 - Applications and most framework code executes in a virtual machine
- Native libraries, daemons and services
 - Written in C or C++
- Linux kernel
 - Drivers for HW, networking, file system access and interprocess-communication



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Work Flow

- Setup
 - Development tools
 - AVDs
- Development
 - UI design
 - Logic programming
- Debugging and Testing
- Publishing

Through Google Play

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Producing an Android App



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Android Development Tools (ADT)

- A plugin for Eclipse IDE
 - SDK tools integration
 - Java and XML editors

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Android Studio

- Another Android development environment based on JetBrain's IntelliJ IDEA
 - Announced on 16/05/2013.
 - Live layout: WYSIWYG editor.
 - Gradle-based build support





MIT App Inventor

- Originally provided by Google, and now maintained by MIT.
- Allow users, who may have no experience in computer programming, to create android Apps by drag-and-drop visual objects





Examples

- Android Sensor Box
 - Detects and demonstrate capabilities of all sensors of Android devices.
- manageWifiScans
 - Build WLAN signal strength maps.
 - Starting point of term project for indoor wireless localisation.



