EMBEDDED SYSTEMS PROGRAMMING 2015-16

Introduction to the Course

What is an embedded system?

EMBEDDED SYSTEM?

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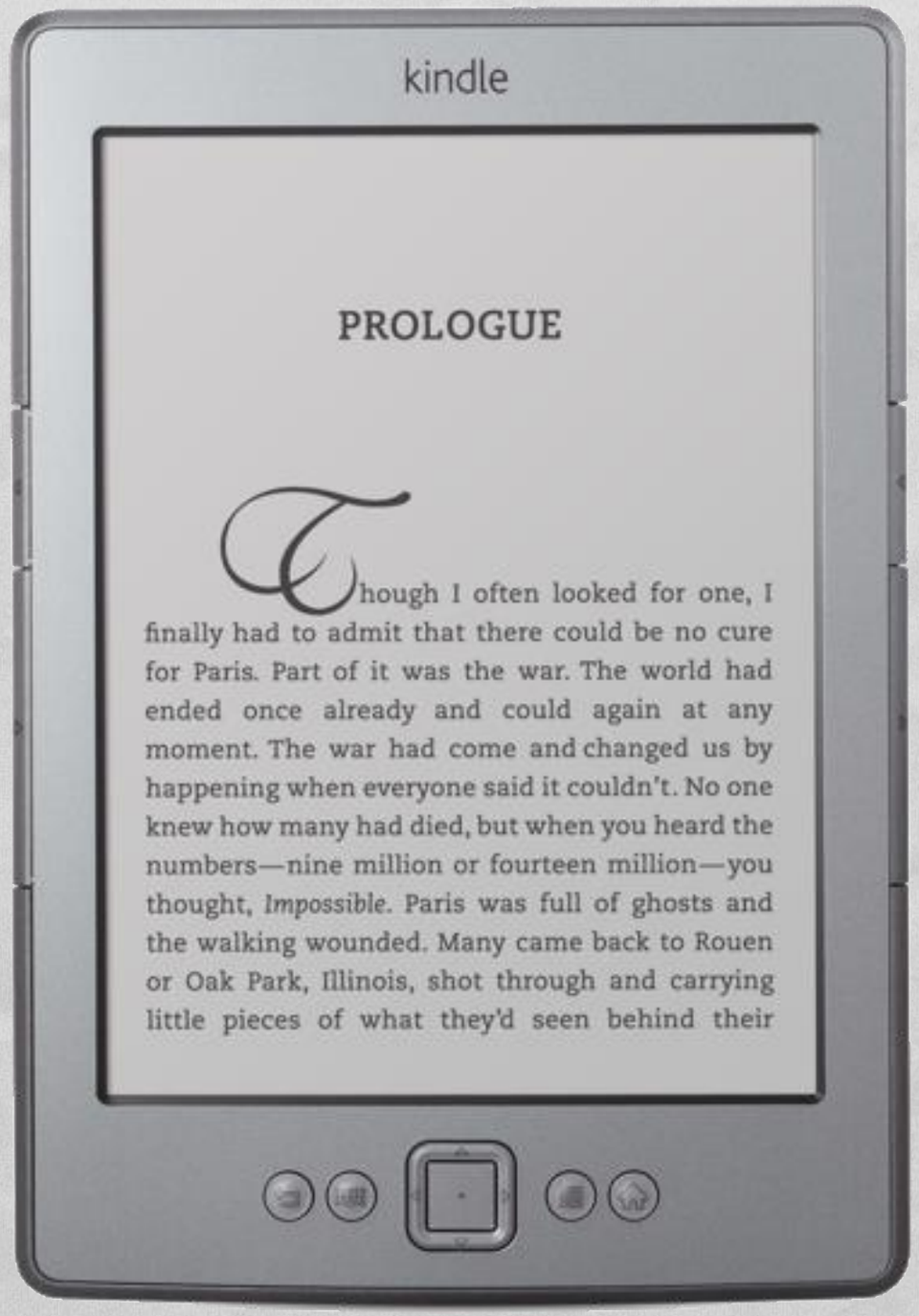


EMBEDDED SYSTEMS

A computer is designed
to be flexible, while
an embedded system
performs one or a few
dedicated functions

IS IT ALWAYS TRUE?

EMBEDDED SYSTEMS

An embedded system has limited resources

(CPU, RAM, storage...)

IS IT ALWAYS TRUE?

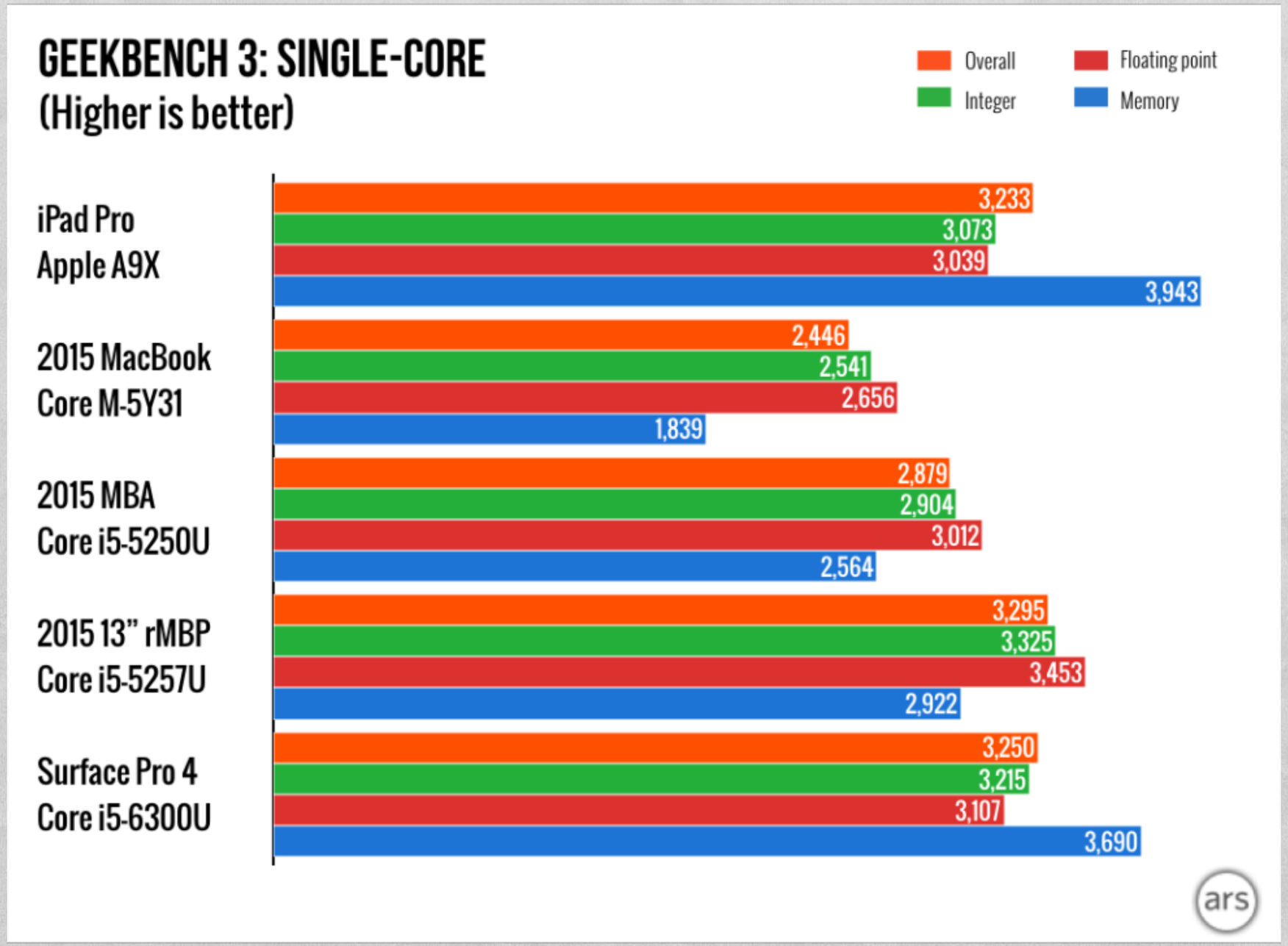
2004 PC

2.8 GHz CPU
512 MB RAM
120GB storage

2014 phone

2.7 GHz CPU (4x)
3072 MB RAM
64GB storage

IS IT ALWAYS TRUE?

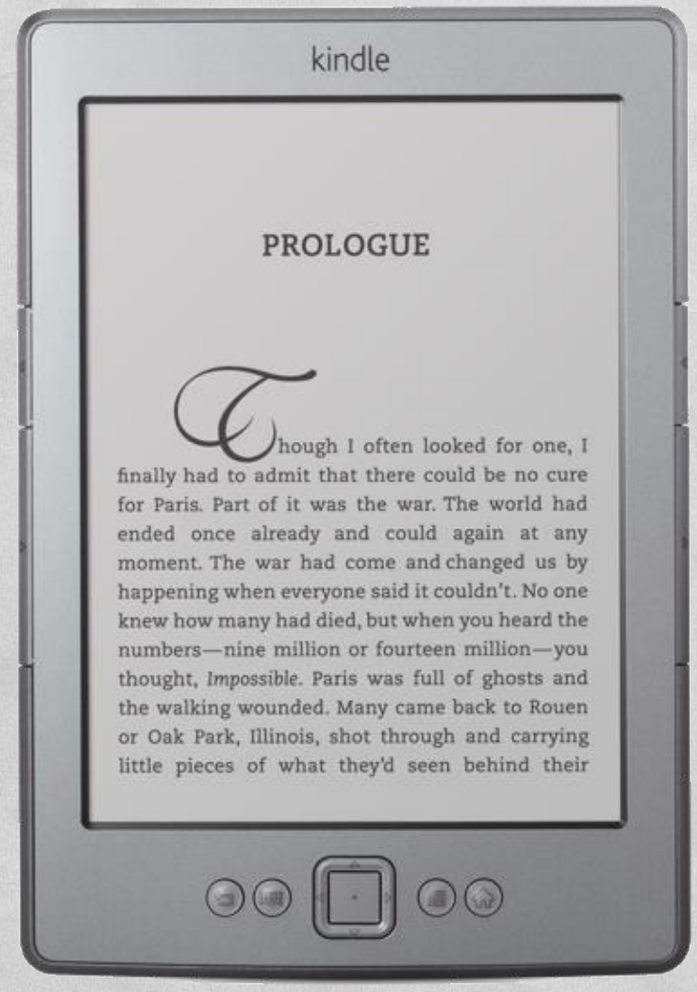


Sources: ArsTechnica, AnandTech

EMBEDDED SYSTEMS

An embedded system has real-time constraints

IS IT ALWAYS TRUE?



Java ⇒ garbage collection

⇒ no deterministic response time

EMBEDDED SYSTEMS

Embedded system are programmed with low-level languages (assembly or the like)

IS IT ALWAYS TRUE?

EMBEDDED SYSTEMS IN THIS COURSE

- **Complex, mobile platforms**

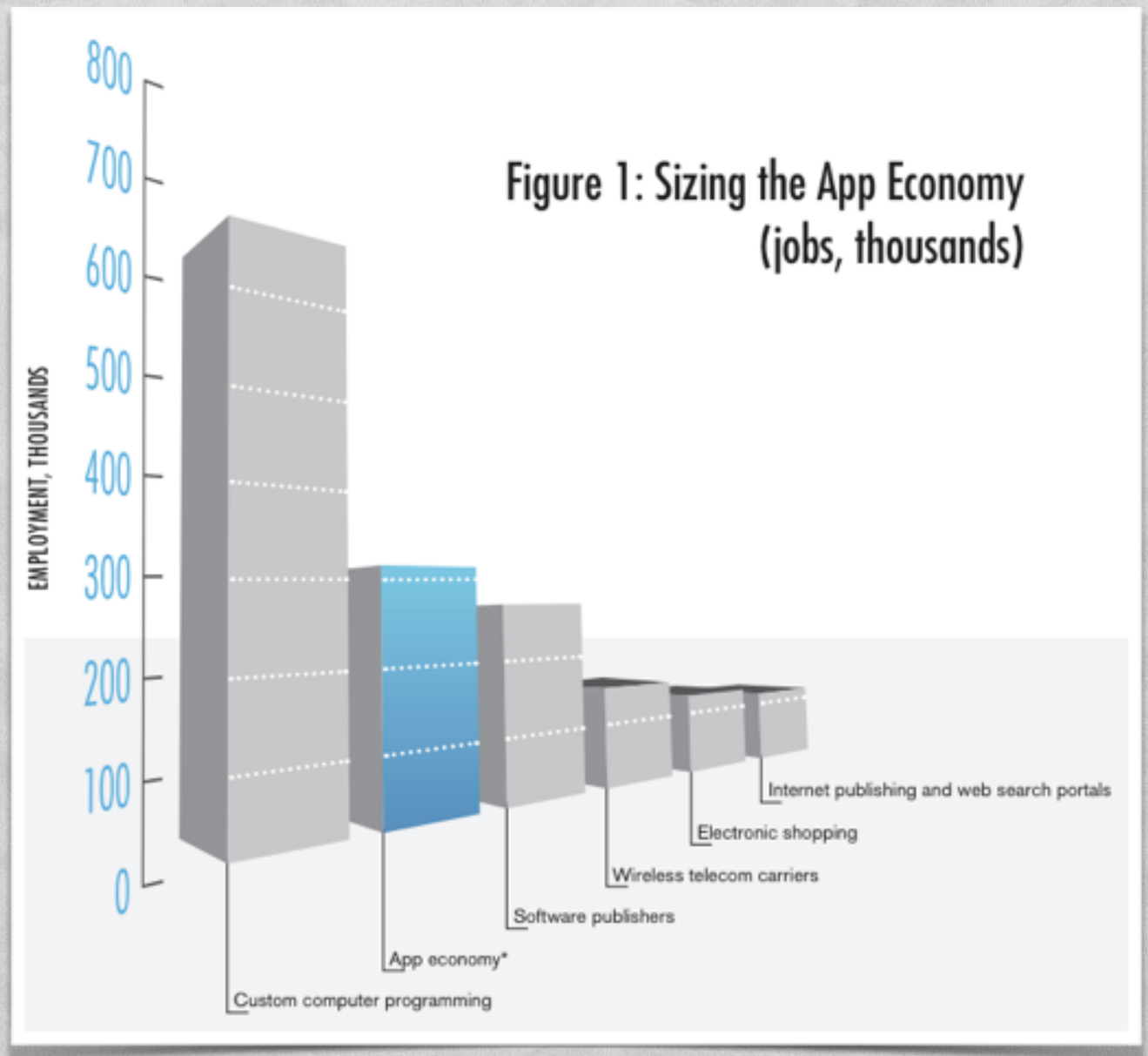
- Enormous growth and popularity in recent years
- High-level programming,
  leveraging on sophisticated libraries
- Languages: Java, C++

MOTIVATION (1/2)

(C) John Stanmeyer

MOTIVATION (2/2)

- **Hundreds of thousands of jobs** in the "App economy"



Data for the U.S.

Source: TechNet study, 02/2012

AIM OF THE COURSE

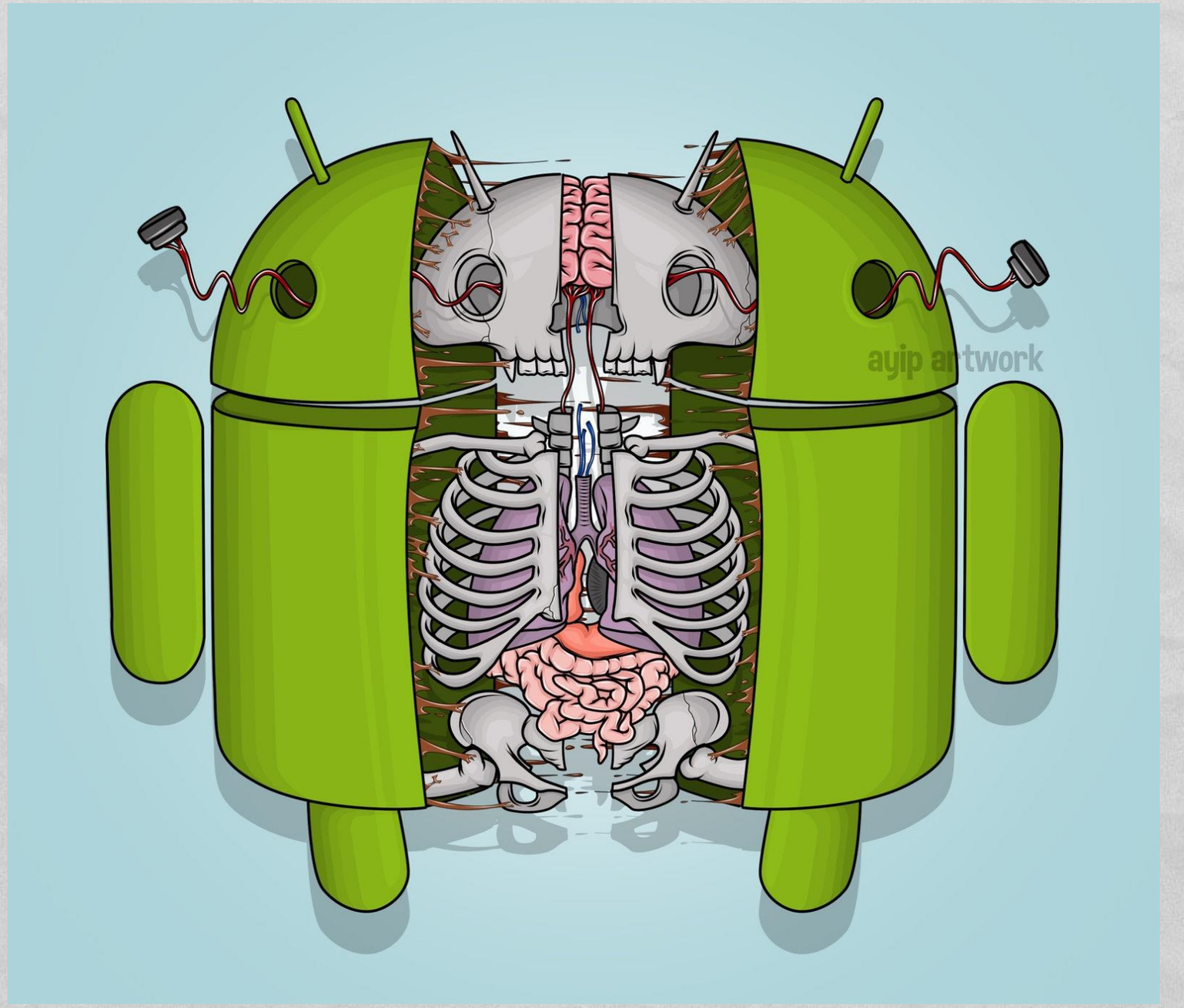
Embedded Systems PROGRAMMING

TM and ©: FOX

ANDROID

- $>10^9$ devices sold in 2014
- Cheap devices available
- Open source*
- Developed apps can be installed at no cost

NOT THIS…



(C) ayipart

…BUT THIS

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