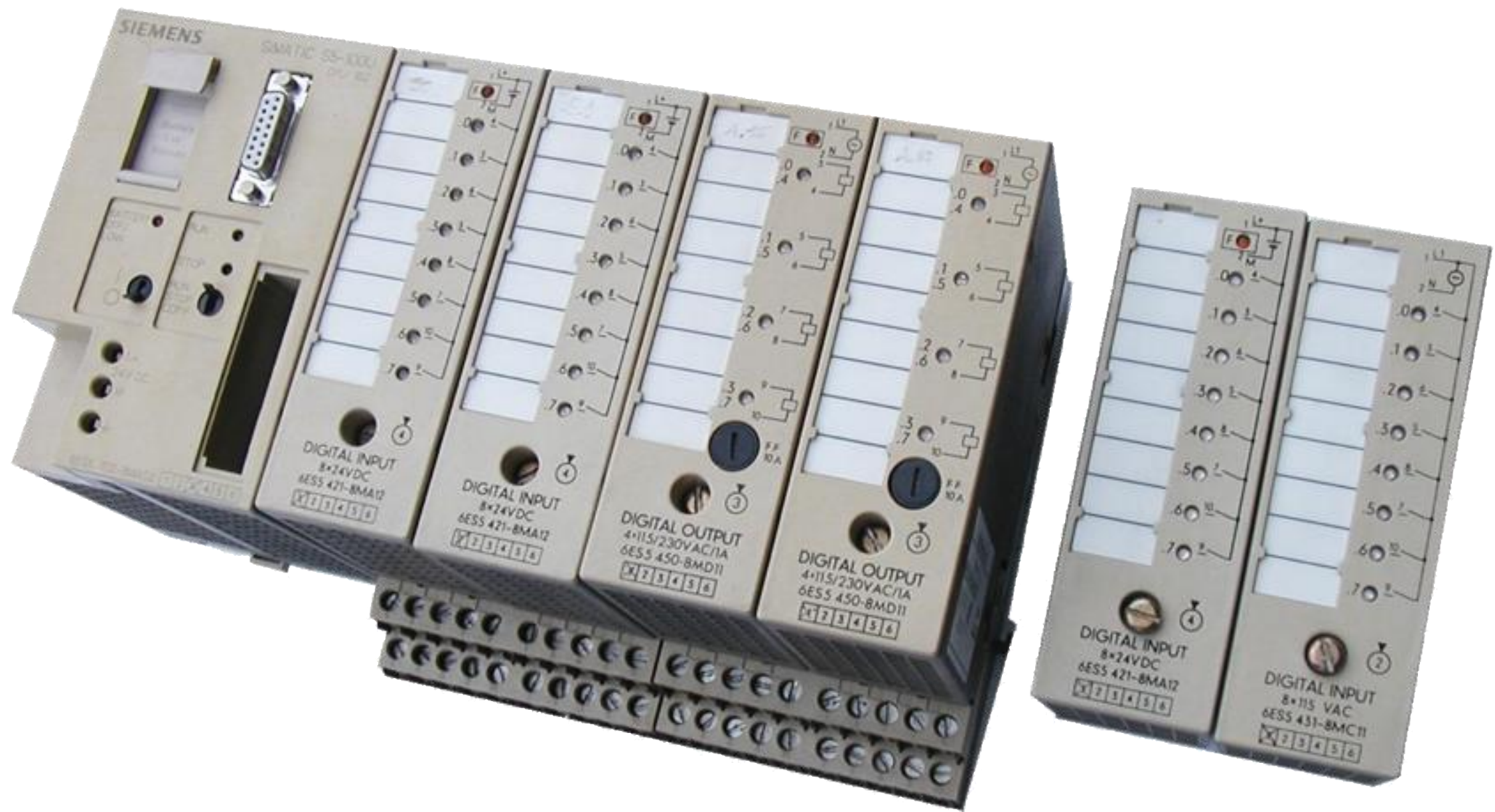


EMBEDDED SYSTEMS PROGRAMMING 2016-17

Introduction to the Course

What is an
embedded
system?

EMBEDDED SYSTEM?



EMBEDDED SYSTEM?



EMBEDDED SYSTEM?



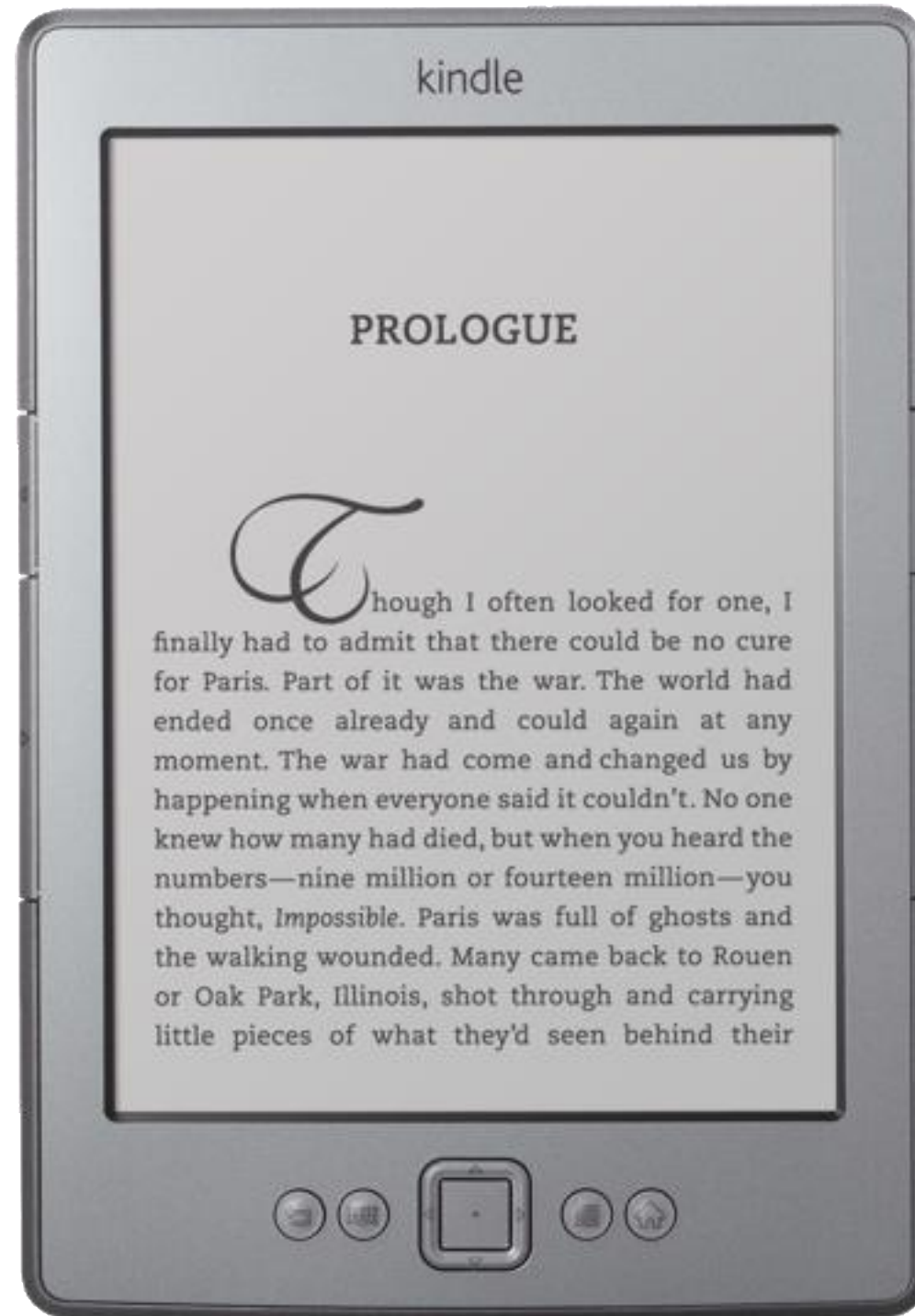
EMBEDDED SYSTEM?



EMBEDDED SYSTEM?



EMBEDDED SYSTEM?



EMBEDDED SYSTEMS

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

IS IT ALWAYS TRUE?



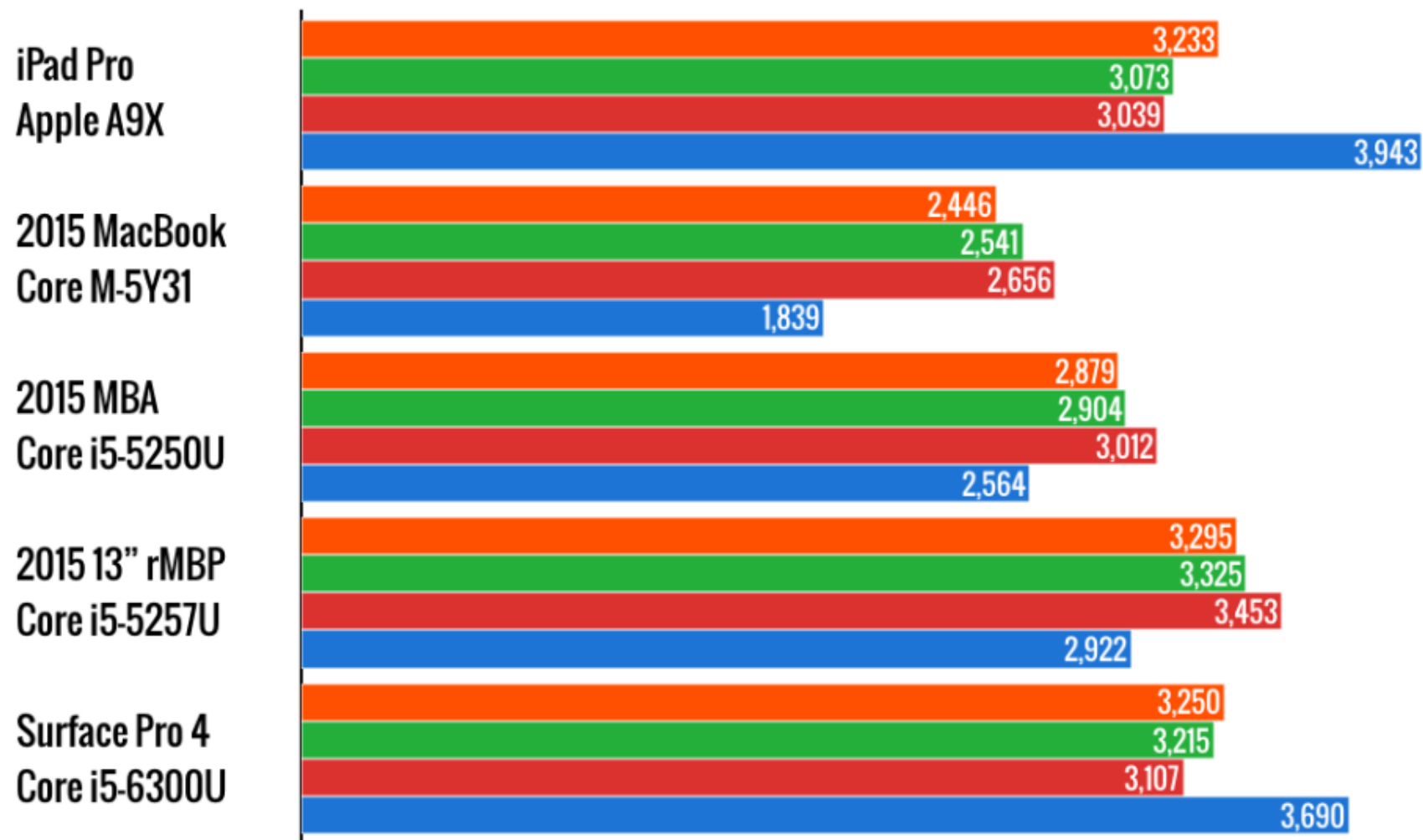
EMBEDDED SYSTEMS

**An embedded system has
limited resources
(CPU, RAM, storage...)**

IS IT ALWAYS TRUE?

GEEKBENCH 3: SINGLE-CORE (Higher is better)

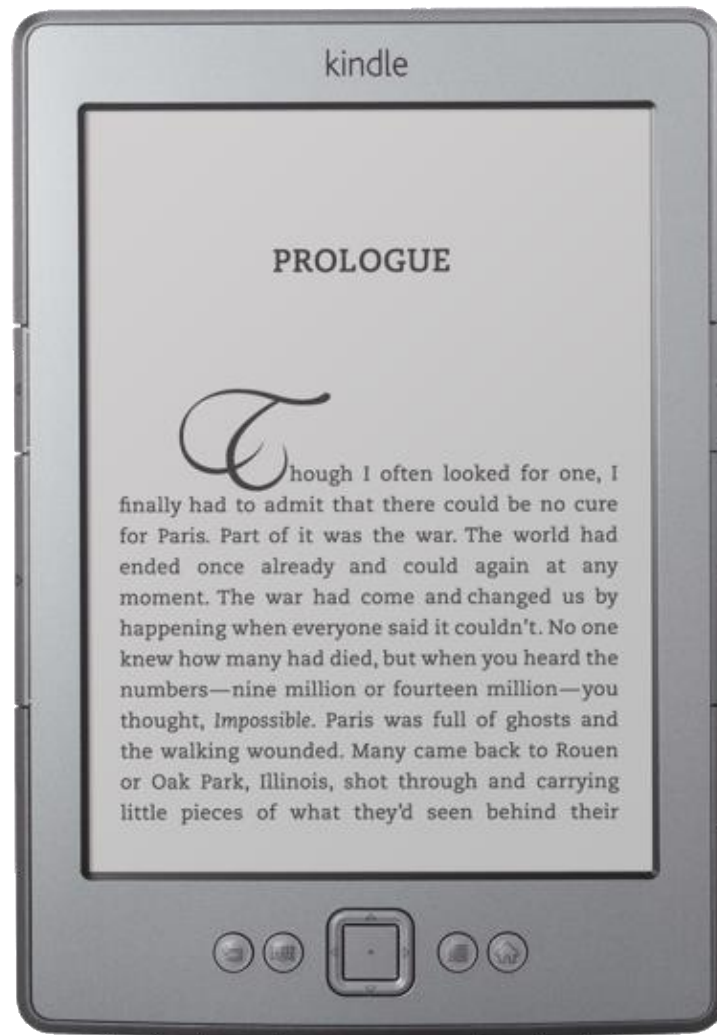
Overall Floating point
Integer Memory



EMBEDDED SYSTEMS

**An embedded system has
real-time constraints**

IS IT ALWAYS TRUE?



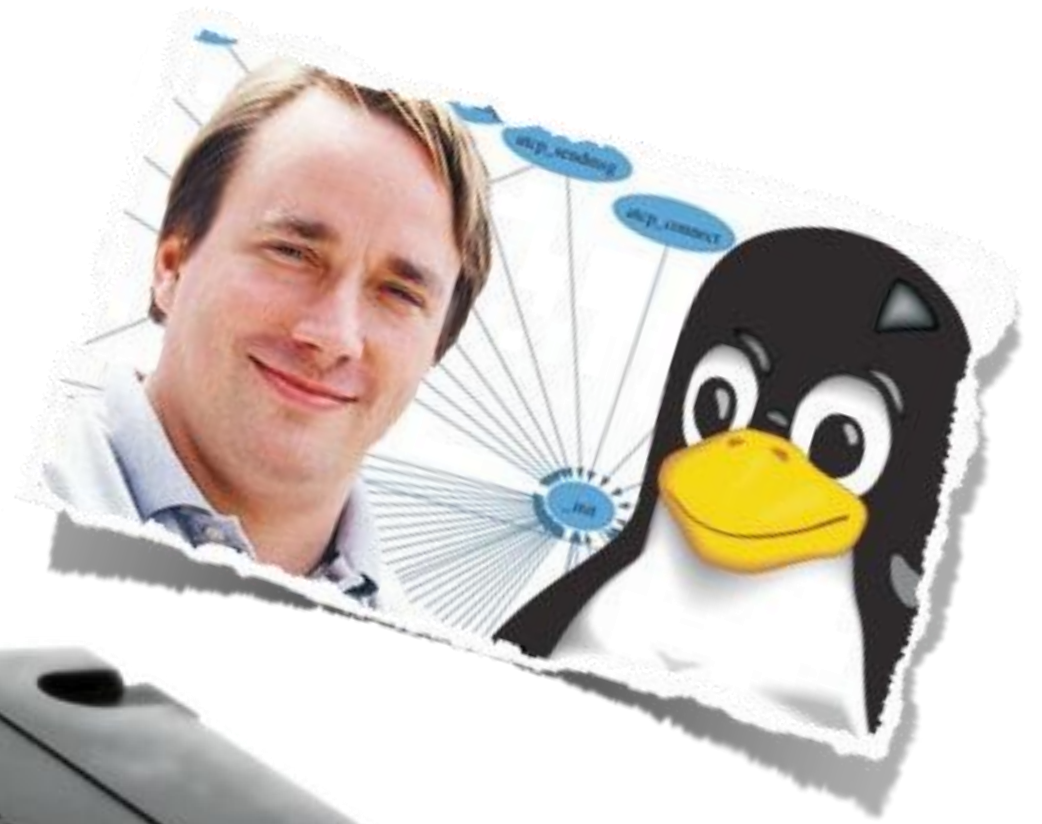
Java \Rightarrow garbage collection

\Rightarrow no deterministic response time

EMBEDDED SYSTEMS

Embedded systems 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++**

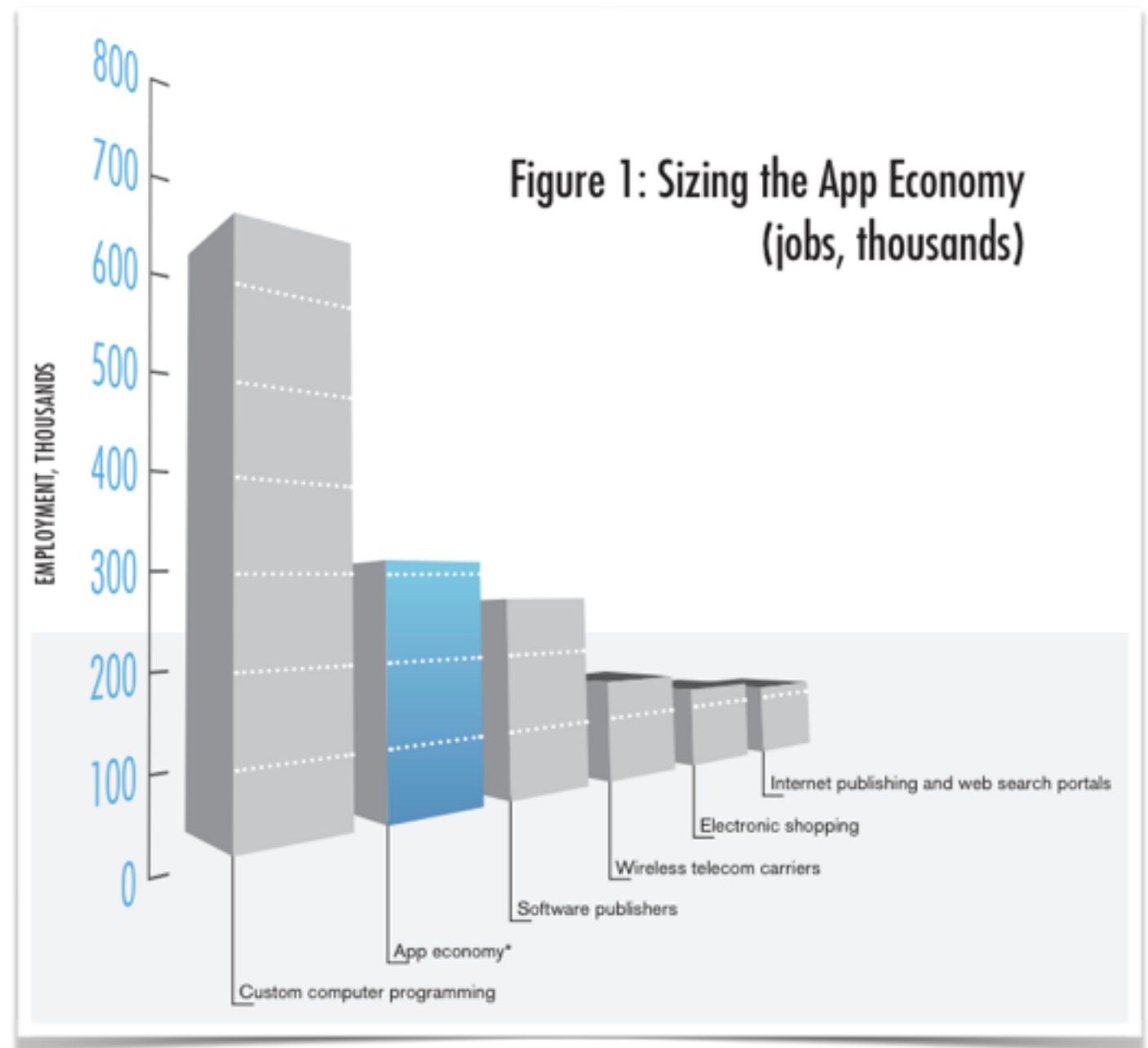


MOTIVATION (1/2)



MOTIVATION (2/2)

- Hundreds of thousands of jobs in the “App economy”



Data for the U.S.

Source: , 02/2012

AIM OF THE COURSE

Embedded

Systems

PROGRAMMING

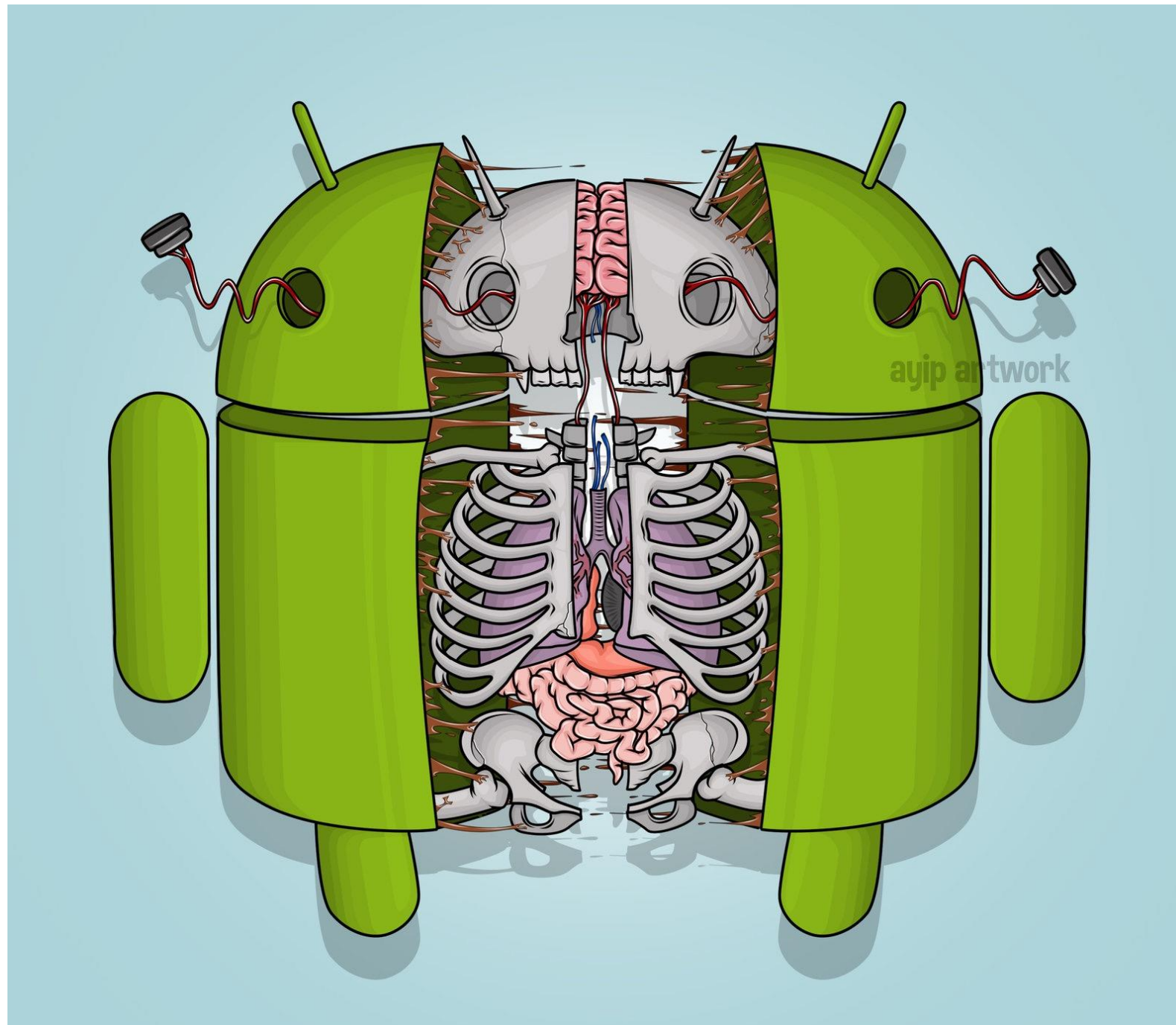


ANDROID



- Market share >80% (4Q16)
- Cheap devices available
- Open source*
- Developed apps can be installed at no cost

NOT THIS...



...BUT THIS

Java

C++



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