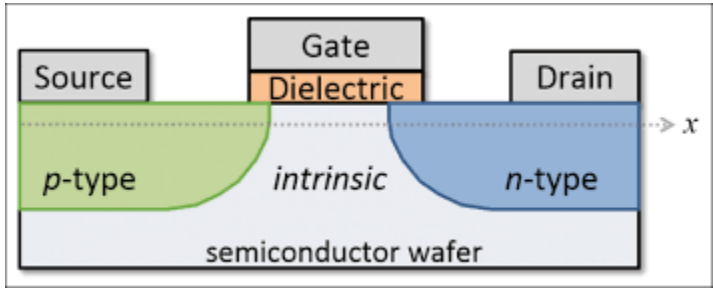
Introduction to Computer Science and Media Computation, part 2

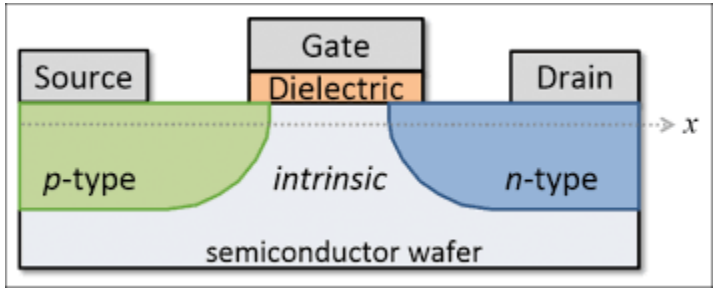
Lecture 2

What Computers Understand

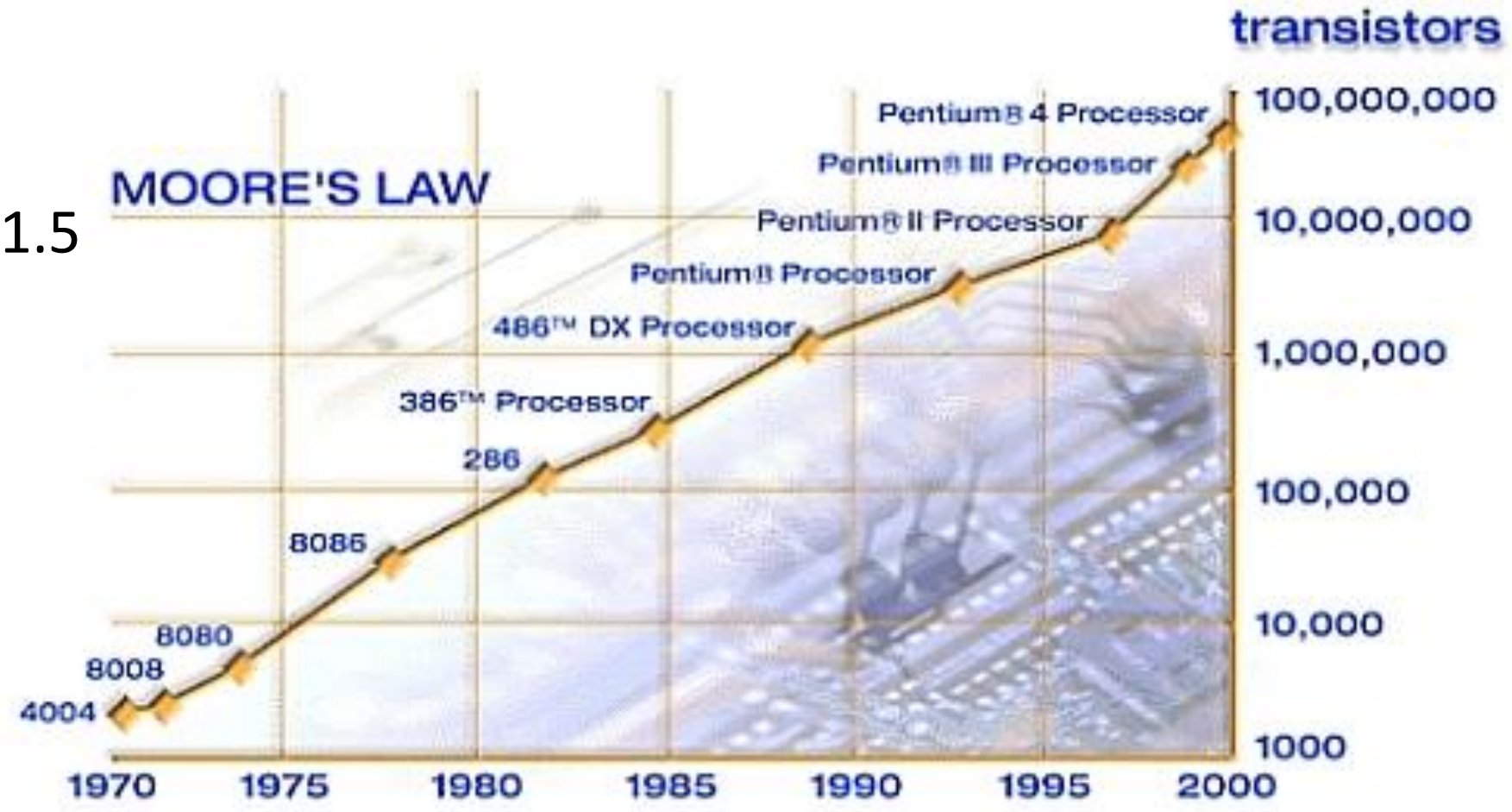


- Encoding: eight "bits" == one "byte"
  - "bit" means "binary digit"
- Computery numbers
  - 256
  - 512
  - 1024

Digital Media



- Moore's Law: Computer power doubles for the same price every 1.5 years



Programming as a Process

Need to know:

- How to write the instructions - "source code"
- How to convert source code → machine code - "interpret", "compile"
- How to run the machine code - "execute"

Choices

- Where and when
- Capabilities
- Skills

Interpreted and Compiled Languages

Compiled

1. Source code
2. Run compiler; create the executable
3. Distribute and run the executable

Interpreted

1. Source code
2. Distribute
3. Interpret

Ready to run, but not portable

Optimized; runs faster

Private source code (proprietary)

Cross-platform (portable)

Simpler/faster to write source

Runs slower

Open source only

Third option: hybrid

- Both compiled and Interpreted
- Intermediate Language, a.k.a. Byte Code
- Just In Time (JIT) compilation

Compiled
- C
- C++
- Objective-C

Interpreted
- PHP
- JavaScript

Hybrid
- Java
- C#
- .NET
- Python

Media Computation: Why Digitize Media?

- The physical world (five senses) →
- 0s and 1s →
- store/recall | manipulate | transmit →
- The physical world (five senses)

- Understand: physics and psychophysics
  - A whisper in a symphonic performance
  - An entire room in a photograph

Avis

Computer Science for Everyone

- It’s About Communication
- It’s About Process
- You Will Probably Need It