

Computer Organization and Architecture

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Recurring Themes

Abstraction

- Productivity Enhancer. No need to worry about detail.
- Important to understand components and they function together.

Hardware and Software are symbiotic, not opposing.

Turing Machines

Turing's Thesis: Every computation can be represented with a Turing Machine.

Turing Machine: A mathematical model of a device that can perform any computation.

Universal Turing Machine: A machine to implement any and all Turing Machines.

Beyond models, real world constraints include time, financial cost, power, security, thermal dissipation, space, etc.

Bits, Data Types, and Operators

The electro-magnetic field is not digital, yet all of modern computing is represented digitally. To compromise, 0 is a representation of the absence of voltage and 1 is a representation of the presence of voltage.

0V	0.5V	"Illegal"	2.4V	2.9V
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