CSE426 : Principle of Robotics

Introduction to Robotics

- What is Robot
- Robot vs Embedded System
- Robotics

Introduction to Robotics

A Robot is an electromechanical device/machine that is

- **Reprogrammable**
- **Multifunctional**
- **Sensible for environment**

Robot is a machine that physically & intelligently interacts with the physical world.

Introduction to Robotics

An Embedded Systems is a combination of HW and SW which is designed to perform a specific task by a given time.

- Washing machine
- Digital Camera
- Microwave oven etc

(once upon a time mobile !) but smartphone is not an ES but General Purpose Computer.

ES vs General Purpose Computer

Parameters	Microcontroller (ES)	Microprocessors (Robot!)
1. Applications	Dedicated for specific task	Gaming, Web browsing, photo editing, Documents creating, Mathematical analysis, Simulation etc
2. Internal structure	CPU, Memory, I/O are present internally in the same chip	CPU, Memory, I/O are present separately
3. Cost	Low	High
4. Power consumption	Low	High
5. Clk Speed	1MHz-300MHz	1GHz-4GHz
6. RAM	2KB-256KB	512MB-32GB
7. ROM	32KB-2MB	128GB-2TB
8. Address & Data Bus	4bits, 8bits, 16 bits, 32 bits	32bits, 64bits

ES vs General Purpose Computer

- Most (but not all) robots use embedded systems but not all embedded systems are robots.
- A conveyor belt isn't a robot… but add an electric eye so it automatically starts & stops (when groceries are removed & added) and now it's a (simple) robot.
- The difference in this case is "intelligence".

Robotics

Robotics is the engineering discipline dealing with the design, construction, operation and maintenance of robots.

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Thank you and Take Care