

EMBEDDED SYSTEMS DESIGN

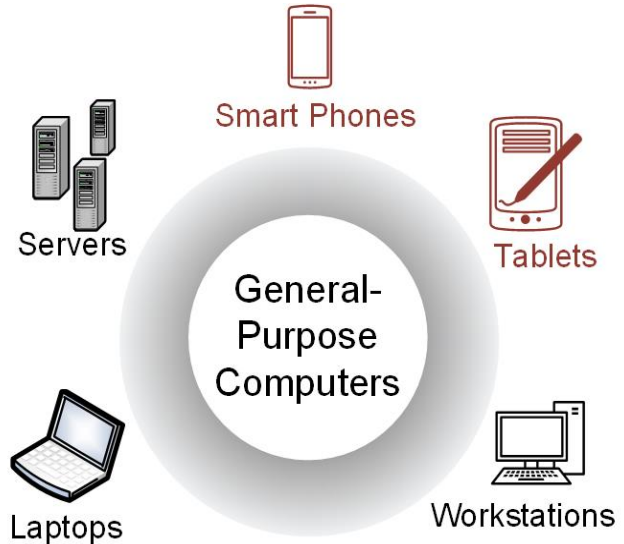
CHAPTER 1: INTRODUCTION TO EMBEDDED SYSTEMS

1.1 WHAT IS AN EMBEDDED SYSTEM?



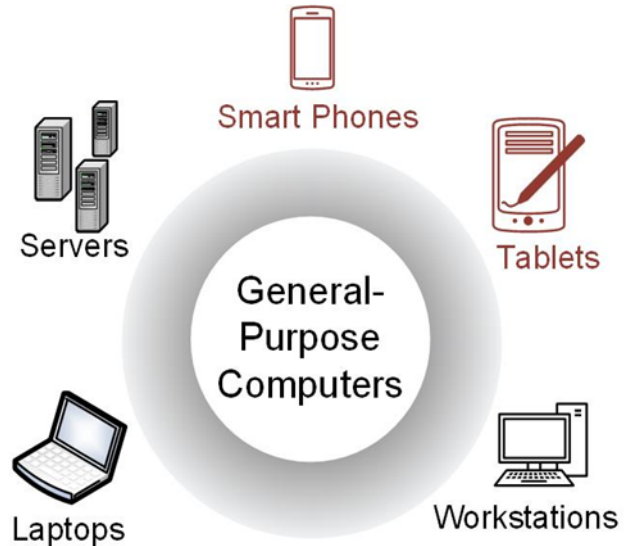
GENERAL-PURPOSE COMPUTERS

- Able to run a variety of software.
- Contain relatively high-performance hardware components (fast processors, data & program storage).
- Require an operating system (OS).



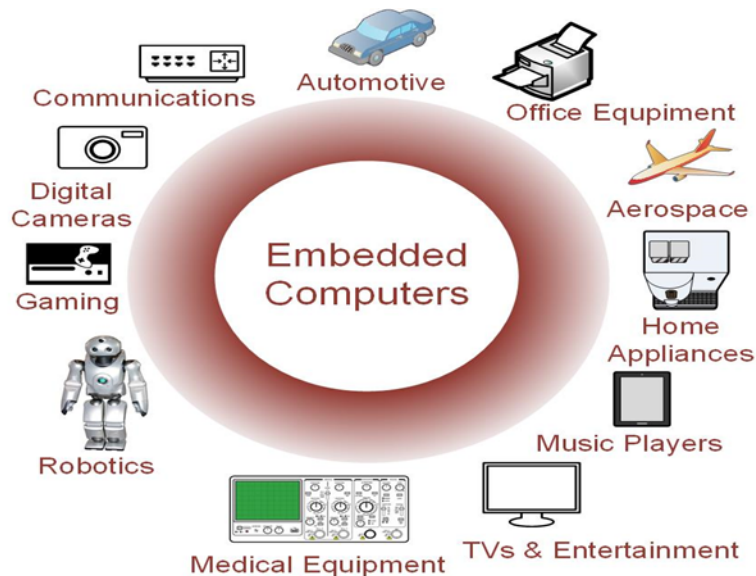
GENERAL-PURPOSE COMPUTERS

- Designed for heavy user interaction.
- Uses a variety of peripherals (displays, keyboards, mice, internet connections, wireless communication capability).
- Expensive (\$100s - \$1000s).
- Use a group of integrated circuits or chips (ICs).
 - One implements the central processing unit (CPU).
- Several implement data memory and program storage.



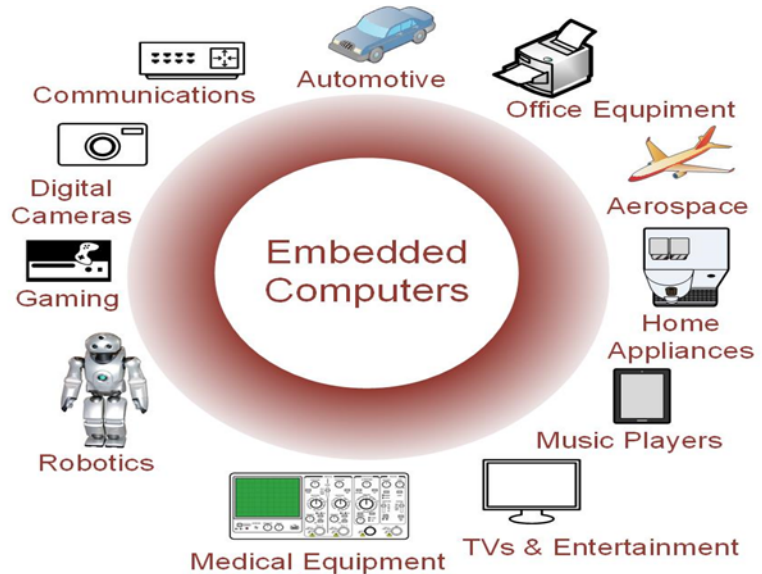
EMBEDDED COMPUTERS

- Resources can be implemented on a single IC.
- Include a variety of peripherals (timers, analog-to-digital converters, digital-to-analog converters, serial interfaces).
- Small size makes them very versatile.



EMBEDDED COMPUTERS

- Contains firmware (only the *needed* software which is not intended to be changed frequently).
- May contain Real Time Operating Systems (RTOS) which are used as a task scheduler.
- Low cost (10s of cents to a few dollars).



EMBEDDED COMPUTERS

