Embedded Systems

Introduction

Team Emertxe

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Embedded Systems

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Introduction to Embedded System

Embedded Systems
Introduction

- What is ES
- Examples
- Categories
- Components
- Requirements
- Challenges
- Trends in Development
- Common Design Metrics

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Embedded Systems

What is Embedded Systems - Definition

"Any Hardware System which is intended to do a specific task

can be called as an Embedded System"

Embedded Systems

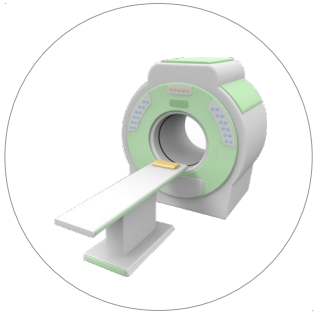
Examples

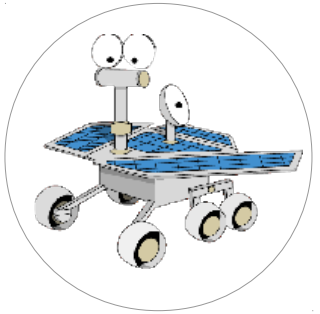








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Embedded System

Categories

- Stand-alone
- Real Time
- Networked
- Mobile

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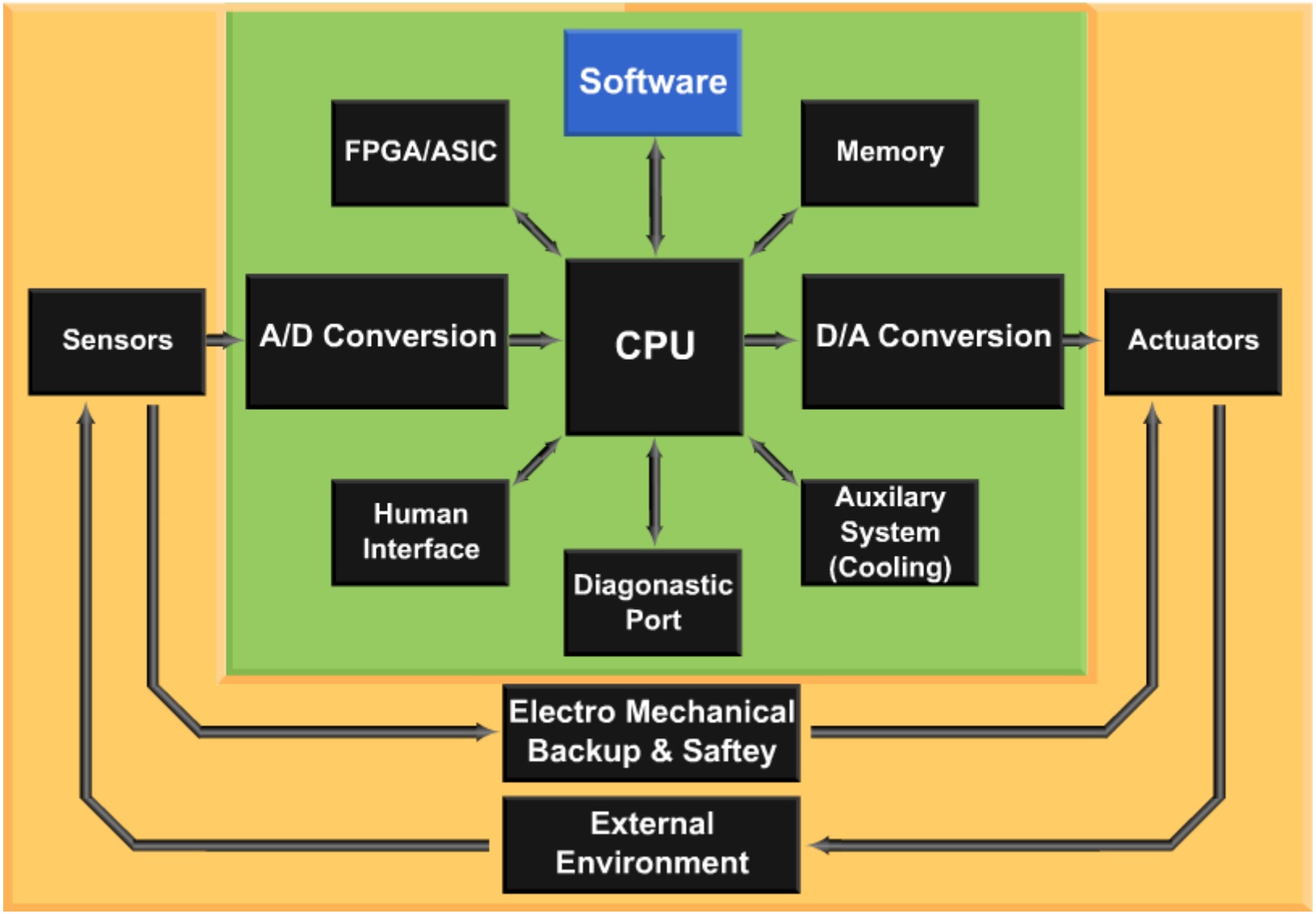
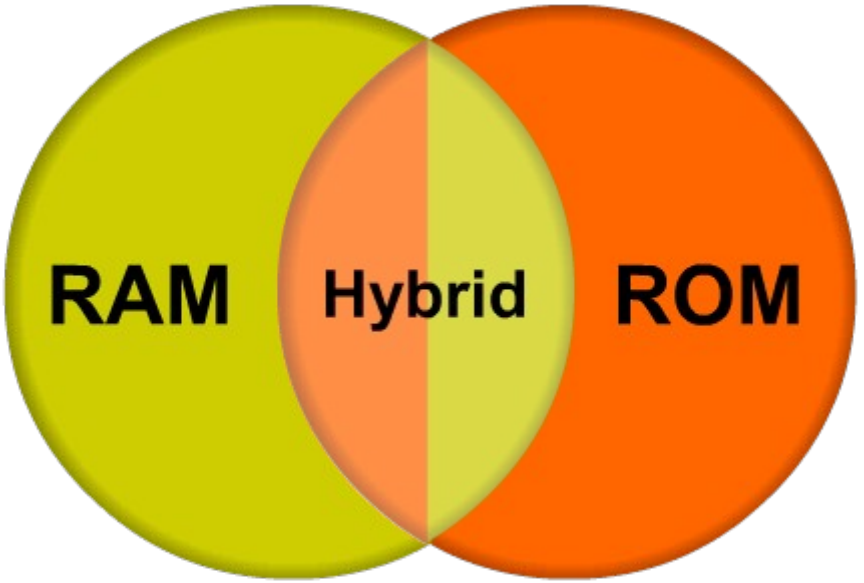
Embedded System
Components



Embedded System

Components - Memories



Embedded System

Components – Memories - RAM

- DRAM
- SRAM

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Components – Memories - ROM

- UVPROM
- EPROM
- PROM
- Masked ROM

Embedded System

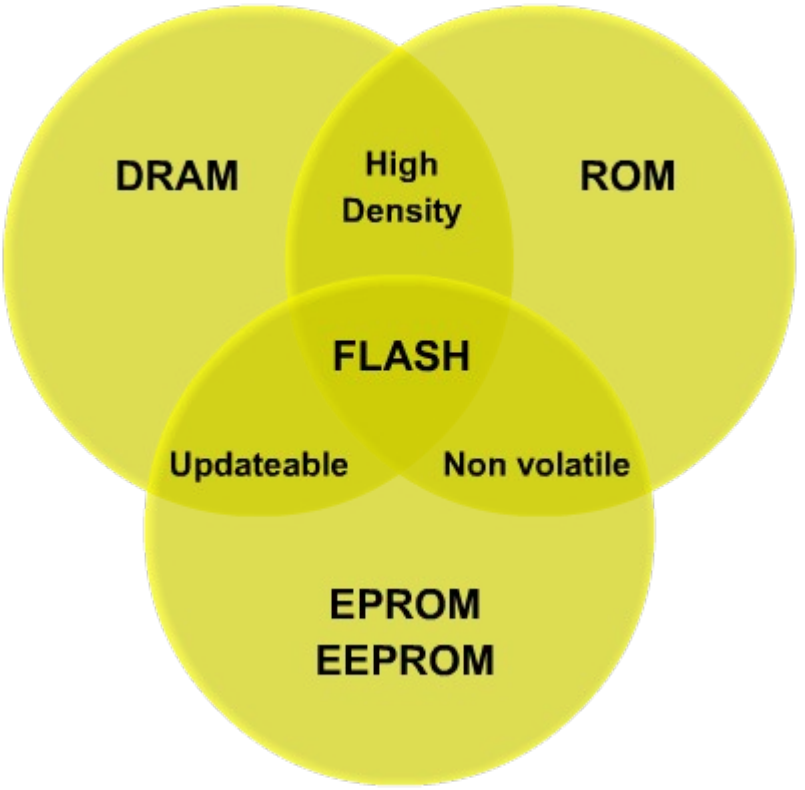
Components – Memories - Hybrid

- NVRAM
- EEPROM
- FLASH

Embedded System

Components – Memories – Hybrid - Flash

- NOR
- NAND



Embedded System
Requirements

- Reliability
- Cost-effectiveness
- Low Power Consumption
- Efficient Usage of Processing Power
- Efficient Usage of Memory
- Appropriate Execution Time






Embedded System
Challenges

- Efficient Inputs/Outputs
- Embedding an OS
- Code Optimization
- Testing and Debugging

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Embedded System

Trends in Development

- Processors
- Memory
- Operating Systems
- Programming Languages
- Development Tools

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Embedded System

Common Design Metrics

- Time to Prototype
- Power
- Performance & Correctness
- Size
- NRE
- Maintainability & Flexibility
- Safety
- Unit Cost
- Time to Market

GPS vs ES

Embedded System
GSP vs ES

- What do you think of your Desktops?
- Does the size matter?
  - Bluetooth Button
  - Industrial Control Systems

Real Time Aspects

Embedded System

Real Time Aspects

- Hard Real Time
  - Should meet its deadline – Life Critical Application
- Firm Real Time
  - Similar to Hard Real Time - Properties
- Soft Real Time
  - Can have tolerance in meeting its deadline

Thank You