

Lesson 8: Classification of Embedded Systems

Small Scale Embedded Systems

Small Scale Embedded Systems

- Designed with a single 8- or 16-bit microcontroller;
- Little hardware and software complexities and involve board-level design.

Small Scale Embedded Systems

- Tools for development of embedded software
 - Editor, assembler and cross assembler,
 - integrated development environment (IDE)
 - specific to the microcontroller or processor used

Median Scale Embedded Systems

Median Scale Embedded Systems

- Designed with a single or few 16- or 32-bit microcontrollers or DSPs or Reduced Instruction Set Computers (RISCs).
- Employ the readily available single purpose processors.

Median Scale Embedded Systems

- Employ the readily available IPs for the various functions—for example, for the bus interfacing,
- Real-time software functionalities
- IDE and RTOS tools for development

Sophisticated Embedded Systems

Sophisticated Embedded Systems

- Used for cutting edge applications that need hardware and software co-design and components integration in the final system

Sophisticated Embedded Systems

- Enormous hardware and software complexities
- May need networked distributed processors on a bus
- May need scalable processors or configurable processors or programmable logic arrays.

Sophisticated Embedded Systems

- Constrained by the processing speeds available in their hardware units.
- Certain software functions such as encryption and deciphering algorithms, discrete cosine transformation and inverse transformation algorithms, TCP/IP protocol stacking and network driver functions implemented in the hardware to obtain additional speeds by saving time

Sophisticated Embedded Systems

- Software implements some of the functions of the hardware resources in the system.
- Development tools for these systems may not be readily available at a reasonable cost or may not be available at all.
- IDE, RTOS and VLSI development tools

Summary

We learnt

- Classification into three – small scale, median scale and sophisticated systems

End of Lesson 8