

# Microcontroller and Embedded Systems

# Classification of Embedded System

1. **Small Scale** Embedded Systems: 8-16 bit microcontroller, little h/w and s/w complexities and involve board level design.

Usually, 'C' is used for developing these systems. The software has to fit within the memory available in the system.

# Contt..

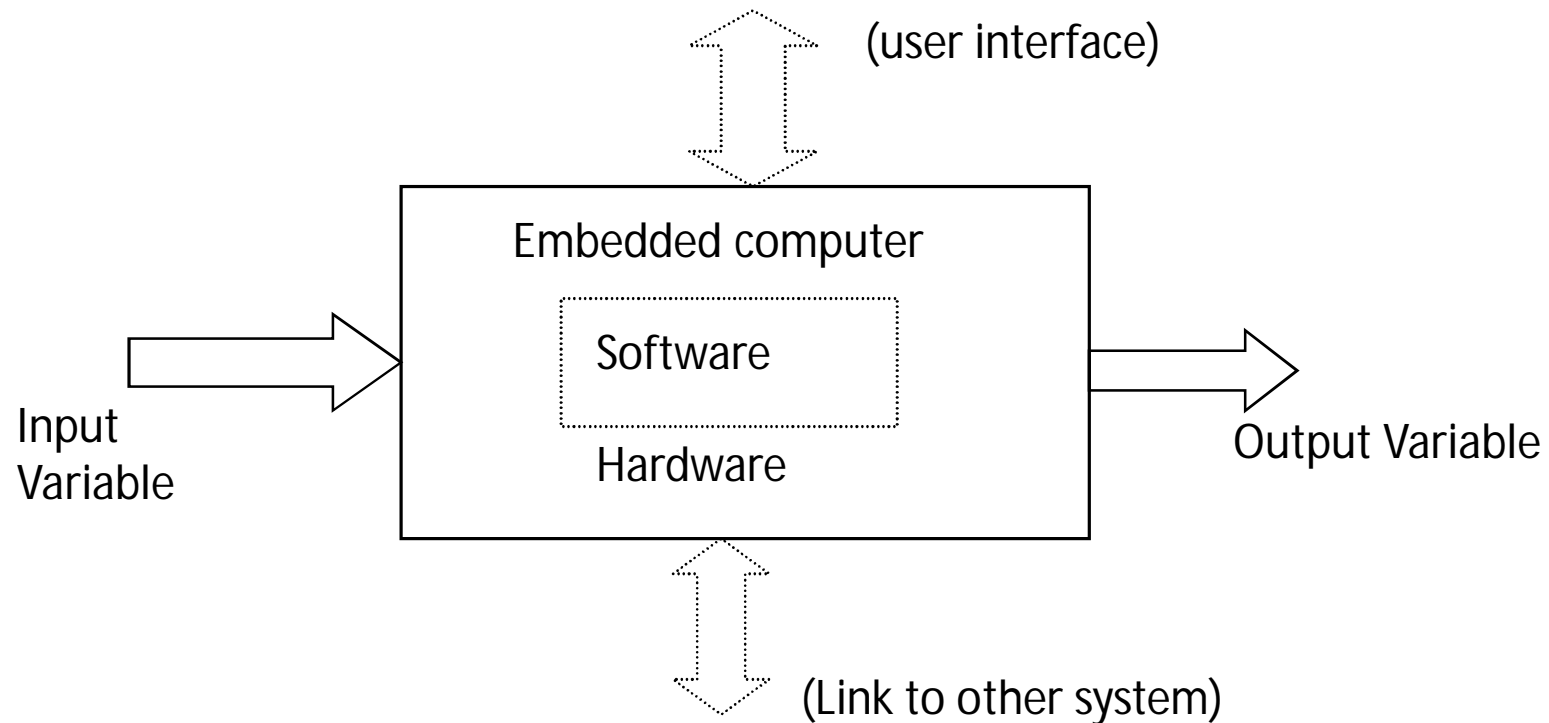
2. **Medium Scale** Embedded Systems:
  - 16 or 32 bit Microcontroller.DSP or RISC
  - H/W and S/W complexities
3. **Sophisticated** Embedded Systems:
  - Enormous h/w and s/w complexities.
  - may need scalable processors, configurable processors.

# Features of the Embedded System

1. Constituents of the embedded computer:  
h/w and s/w
2. Timeliness: The controller must be able to respond fast enough to keep its operation within a safe region.
3. System interconnection
4. Reliability

# The essence of the embedded system

- ESD



# Where are Embedded Systems used?

- **Signal processing systems**
  - Real-time video, DVD players, Medical equipment.
- **Distributed control**
  - Network routers, switches, firewalls, mass transit systems, Elevators
- **“Small” systems**
  - Mobile phones, pagers, home appliances, toys, smartcards, MP3 players, PDAs, digital cameras, sensors, pc keyboard & mouse
- **Modern cars:** Up to 100 or more processors
  - Engine control unit
  - ABS systems (Anti Lock Brake systems)
  - Emissions control
  - Diagnostics and Security systems
  - Accessories (doors, windows etc)

