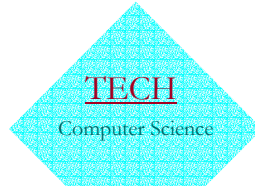


The Concept of Computer Architecture

- Evolution and interpretation
- levels of abstraction
- hierarchical framework
- Extensions
- Description of computer architectures



Evolution of the concept of computer architecture

- Computer architecture (programmer's view)
 - the structure of a computer that a machine language programmer must understand to write a correct (timing independent) program for the machine
- Computer organization (implementer's view)
 - actual hardware structure and realization
- hierarchical, multilevel description
 - electronic circuit, logic design, programming, processor-memory-switch
- functional specification and hardware implementation

Recent interpretation of the concept

- Computer architecture
 - **Underlying computational model**
 - > von Neumann, dataflow, ...
 - **Level of consideration**
 - > micromachine, processor, computer system
 - **Scope of interest**
 - > functional specification, implementation

The concept of computer architecture

- as a Multilevel hierarchical framework
 - See fig. 2.10

Hierarchical description of digital systems

1. operating system
2. Computer system
3. Processor
4. functional block
5. circuit
6. circuit elements

Description of computer architectures

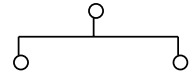
- informal description
- Formal description
 - description by ADLs (VHDL)
 - description by a design space using DS-trees

A brief overview of general purpose ADLs

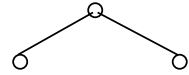
- VHDL
 - Very high speed integrated circuits Hardware Definition Language
 - formal description used by simulation tools
 - circuit, logic, functional, algorithmic, architectural

The design space and its representation Using DS-trees

- A “consists of” B and C



- A “can be performed by” B or C



- A “can be executively performed by” B or C

