Course

Architecture of Digital Systems I

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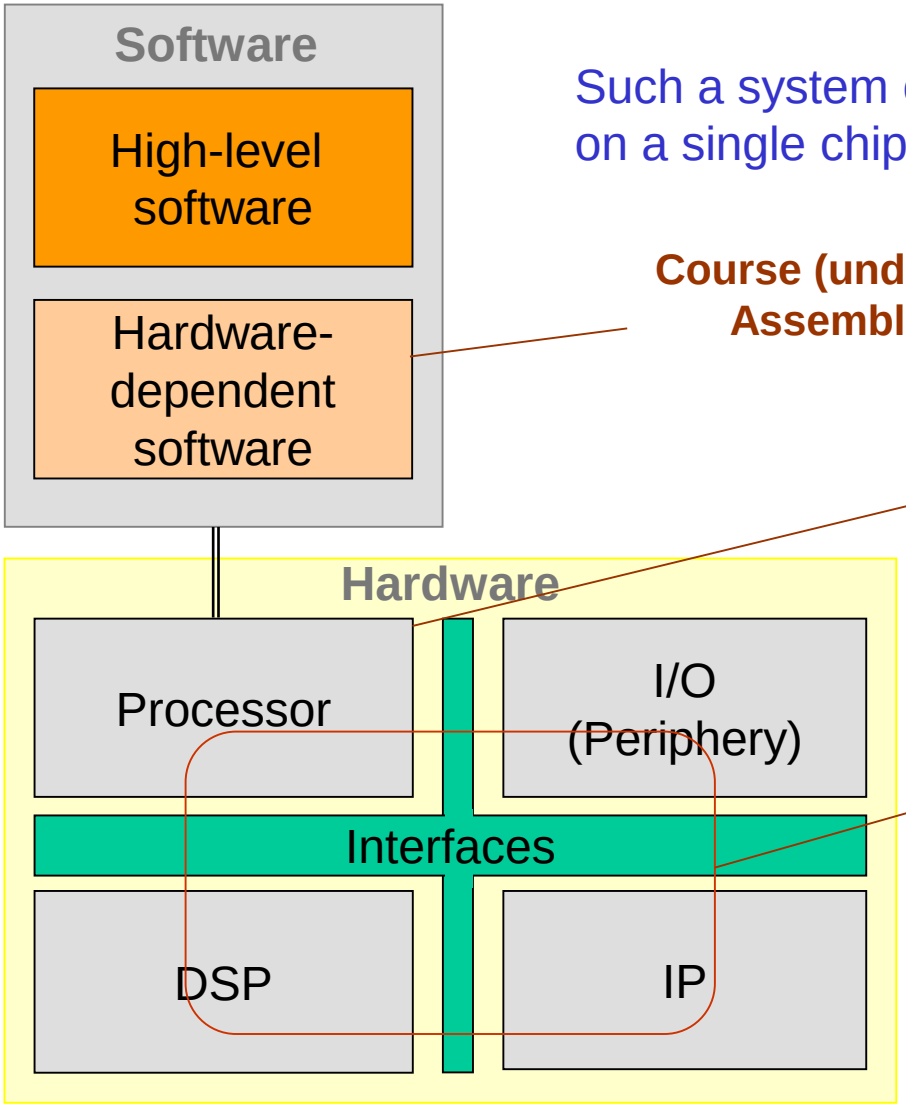
Schedule

Lecture:	date:	Friday, 11.45 - 13.15	4 ECTS credits
	location: 11-207		
Assignments:	date:	Thursday, 11.45 - 13.30	
	location: 11-243		

Slides, exercises and further information:

http://eis.eit.uni-kl.de

Hardware/Software Systems

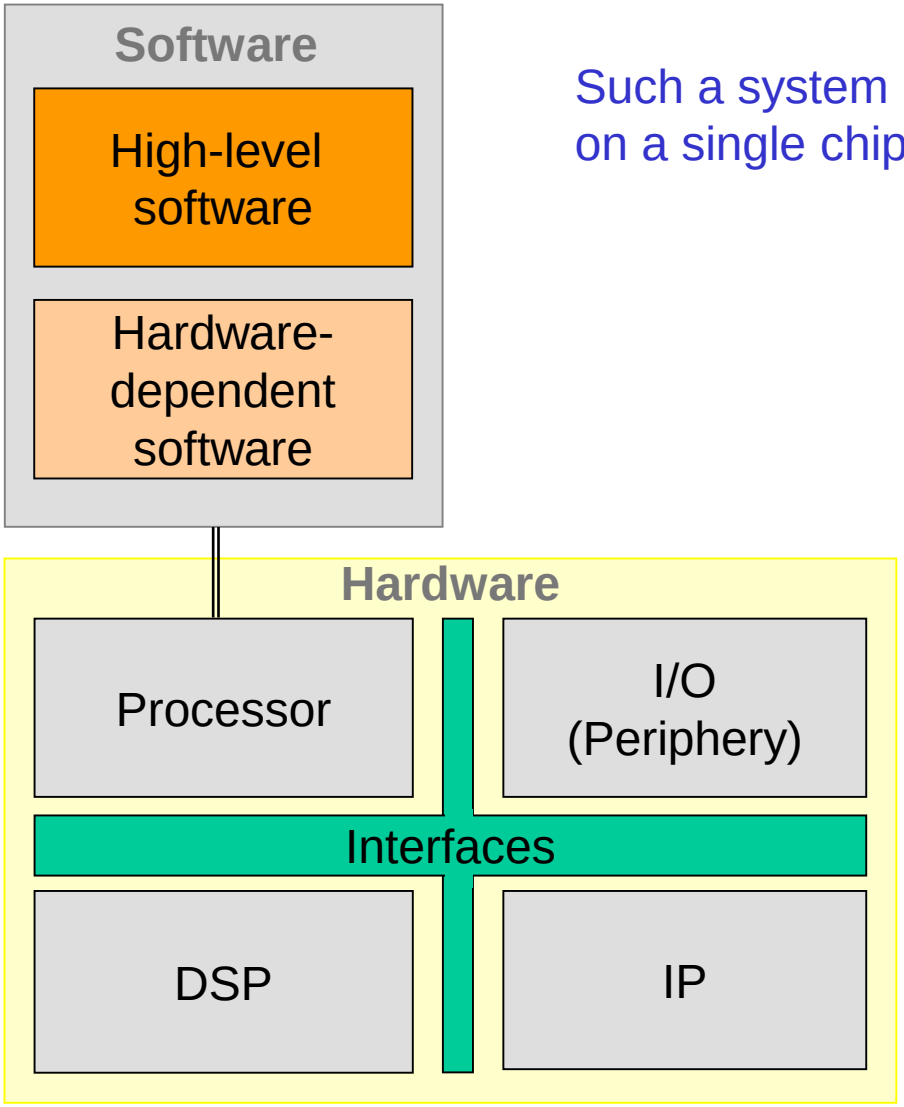


Such a system can be completely integrated on a single chip: “System-on-Chip (SoC)”

Course (undergraduate)
Assembler Programming

Course (Fall)
Architecture of Digital Systems I“
Lab (Spring)
Embedded Processor Design
Course (Fall)
Architecture of Digital Systems II
Lab (Spring)
Embedded System HW Design

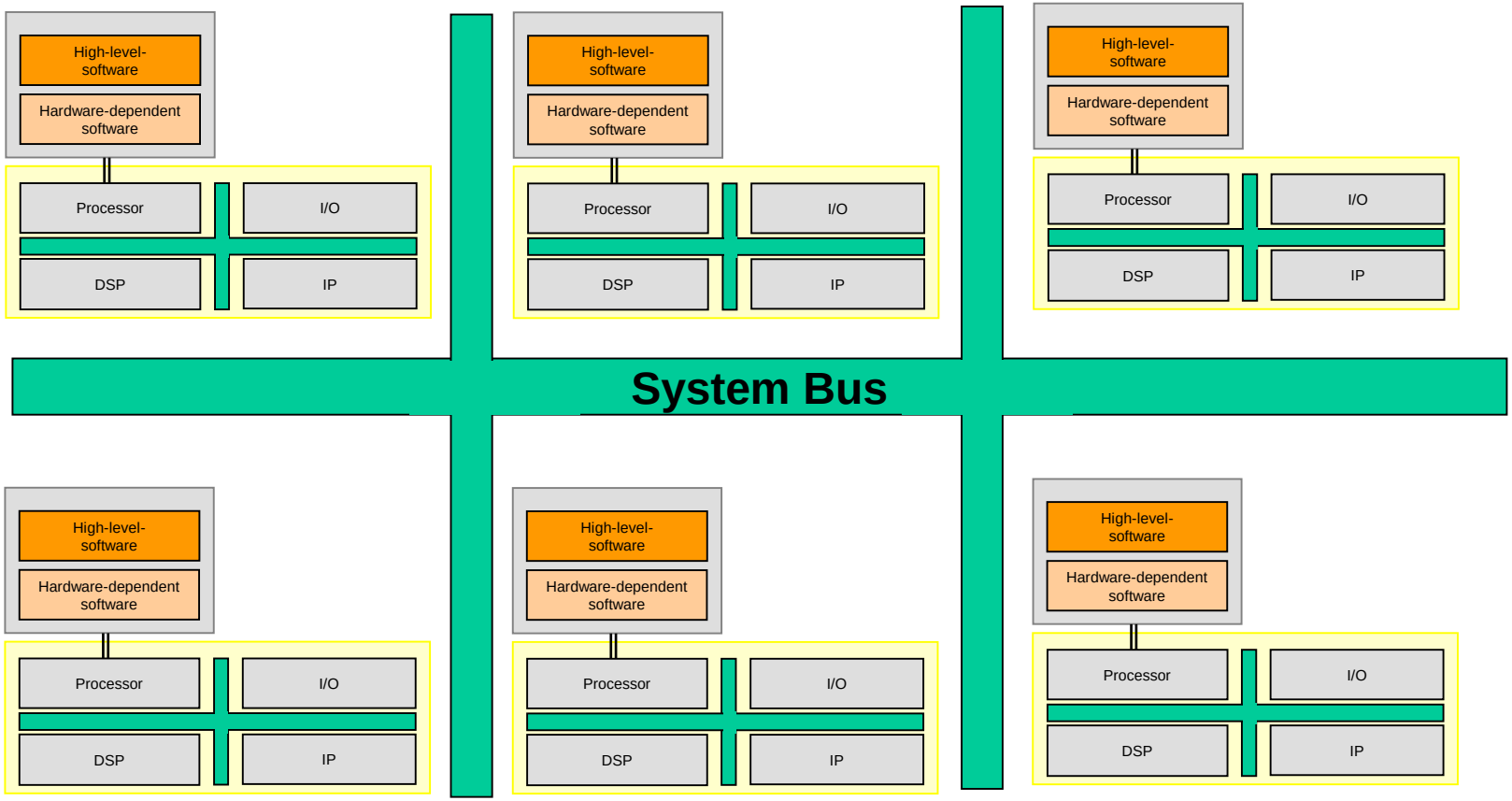
Hardware/Software Systems



Such a system can be completely integrated on a single chip: “System-on-Chip (SoC)”

“Embedded Systems”

Courses:
“Architecture of Digital Systems II"
"Real-Time Systems I, II"



Topic of this lecture

- Processor architecture

- Concentrate on architectures important for embedded applications: RISC (reduced instruction set computer)

Background

- More than 90% of all processors sold world-wide are used in “embedded” applications. This means there is no immediate interface for the human user like a keyboard or a monitor. Instead, the processor is integrated into a larger system (e.g. cell phone, automobile...). It interacts only with the system environment and fulfills application-specific tasks. European industry has a traditional strength in “embedded systems”.

- The processor (“core”) is usually integrated as a block on a system-on-chip.

Literature

Further Reading:

- Patterson/Hennessy: Computer Organization and Design - The Hardware/Software-Interface, Morgan Kaufmann, 2013 (L INF 717)
  (auch als deutsche Version: L INF 55)
- Hennessy/Patterson: Computer Architecture - A Quantitative Approach, Morgan Kaufmann, 2011 (L INF 531)
- Müller/Paul: Computer Architecture - Complexity and Correctness, Springer, 2000 (EIT 860/102)
- Hayes: Computer Architecture and Organization, McGraw-Hill, 1998
- Murdocca/Heuring: Principles of Computer Architecture, Prentice Hall, 2000

Outline

1. Structure and functionality of computers – an overview
2. Instruction set
3. Data representation
4. Computer arithmetic
5. Data path and control
6. Instruction level parallelism
7. Memory Hierarchy