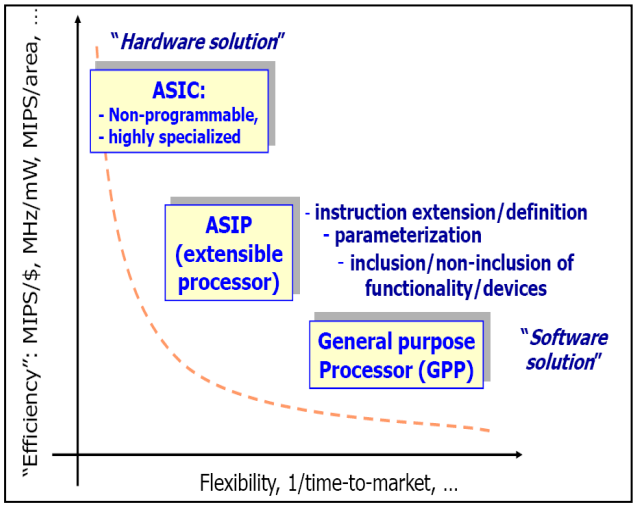
CES **Chair for Embedded Systems**

Prof. Dr. J. Henkel

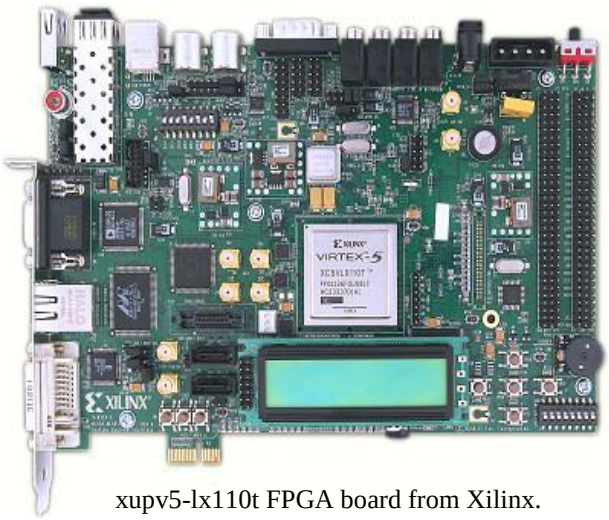
Lab: Entwurf von Eingebetteten applikationsspezifischen Prozessoren

Over the last decade, the technology has risen the embedded processors to become one of the major components for the rapidly growing daily applications like personal mobiles, navigators, etc. ***ASIPs*** (**A**pplication **S**pecific **I**nstruction **S**et **P**rocessors) have become one of the key concerns when it comes to efficiency in terms of performance, energy, and area. It is because ***ASIPs*** provide a very good trade-off between Application Specific Integrated Circuits (ASICs), where everything is executed in the Hardware and they are optimized just for a specific task, and General Purpose Processors (GPPs), where everything in executed in the Software and they are able to do any task.



Joerg Henkel "Design and Architectures for Embedded Systems (ESII)", KIT.

Our lab starts from the point of the importance of ***ASIPs*** in state-of-the-art in embedded processors. It mainly focuses on using the embedded processor Tool-Suites to teach the students how a processor can be modified, by adding new custom instructions, to create an Application Specific Instruction Set Processor under different kind of constraints like area, power, and performance. After several important steps like simulating the new designs (in Software and Hardware), estimating the cost of the new custom instructions, etc., students will download and test their own processors on an FPGA-platform and compare between the different versions of processors in many terms like performance per area, power consumption, etc.



xupv5-lx110t FPGA board from Xilinx.

Exam option:
Any student can make an exam and get a grade if required (e.g. for Bachelor/Master students)

Learning:
- Learn the basics in embedded systems.
- Learn state-of-the-art in the embedded processor Tool-Suites like (ModelSim and Xilinx ISE).
- Work on a FPGA-Platform.

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