Platform Design and Platform Programming

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Platform design, platform programming

[Bar chart showing growth over decades from 1980 to 2020]
Platform design: No Asics anymore

- IBM, ST, Philips settop-box IC
- Nvidia Graphics IC
- Xilinx, Altera etc.
- Qualcomm ICs

- Development cost: $10M – 100M
- Only done for large markets
- Mask Cost is NOT the biggest cost, engineering development cost is (verification!).
Platform programming

- Settop box: Vendor environment, Real-time OS
- Graphics: Microsoft DX10
- Xilinx, Altera: VHDL/verilog, Simulink

The real problem:
Route the data through the system, operand routing
Handle the concurrency
Use the dynamics of the application
Make sure it works!

NOT the problem: +, *, ALUs etc.
Your Thesis work:

- Correct programs
- Concurrent system programming above verilog/VHDL
- Architecture proposals that can stream data, without cache coherency (all virtual, on top of Xilinx, Altera!)
- Programming languages that are NOT control dominated, remove the for and if statements!
- Mapping these languages systematically onto architectures
- Guaranteed Real-Time behavior
- Hardware thread scheduling
- Hide the 1000 cycle memory latency, systematic memory partitioning strategies.