Fraunhofer Institute for Telecommunications

SCUBE-ICT –
Emerging opportunities under
FP7-ICT Call 5

Minsk, 25.-26.06.2009

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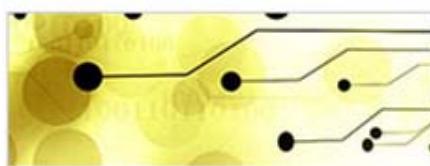
Hardware Architectures & PCB Design

Leading Edge Technology Solutions

- Engineering design expertise in the area of FPGA design, high-speed PCB design and complete system design

- Competence and special know-how:
  - High-speed PCB and system design (specialized in RF layout techniques, applications for beyond 100 Gbps)
  - FPGA implementations and ASIC designs
  - Digital signal processing in hardware (for digital video, image processing, audio, network environments, etc.
  - Protocol stacks development (IP Cores)
  - Software application development

- Design and research capabilities are focused towards innovative technologies and high-end applications

Research Fields and Interests

- Field-programmable logic devices
- Electronic and photonic high-speed communications and technology (beyond 100 Gbps)
- Analog and digital VLSI circuits
- High-speed Interconnects (analysis of parasitic effects, nano-technology, circuit interconnects, copper and optical interconnects)
- Systems and algorithms for (image) data processing
- Parallel signal processing and adaptive computation
- Data compression (lossy / lossless) and digital filters for audio / video applications
- Advanced high-speed compound semiconductor devices, processes and circuits for the telecommunications industry of the future

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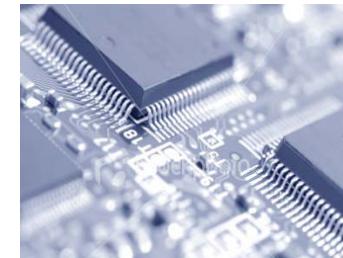
Curriculum Vitae: Dr. Sven-Hendrik Voß

- Senior scientist / project manager / group leader at the FhG-HHI

- Lecturer for teaching engineering classes at University of Applied Sciences (Beuth Hochschule für Technik Berlin)

- Received Dipl.-Ing. degree in Electrical Engineering from Berlin University of Technology in 2003 and the Dr.-Ing. degree in 2008, respectively

- Research interests: image processing, hardware and embedded systems, high-speed data processing, analog and digital RF circuit design, high-speed communications systems, data compression

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Collaboration Requests

- Explore partnership opportunities via industry and research consortia to conduct conjoint research projects
- Implement initiatives to increase cross-faculty research
- Build new links with industry to promote wider opportunities for
  - Collaborative research
  - Supply of new key technologies and / or products
  - Integration of different architectures, systems, standards for future data communication / processing

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Appendix

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29.06.2009
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R&D in the HWA&PCB Group

- Circuits, Architectures and Design
- IC component design (algorithmic level →physical implement. level)
- VHDL implementations and IP Core design
- Multi-platform support: ASICs, FPGA, Microprocessors
- Technology and Devices
- Feasibility studies
- Consulting
- Concept engineering
- Systems and Applications
- System design (Hardware, Firmware, Software)
- PCB design (schematics and layout) and simulation (circuit and EMI)
- Prototype development

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Our Strengths…

- In comparion to other Information Technology Institutes and /or the Industry:

Thorough combination of…

- – Algorithm design
- – Circuit design
- – Circuit and board simulation
- – Layout design for high frequency applications
- – Optical signal transmission (integration)
- – FPGA and ASIC Design
- – RF and Microwave test and measurement

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Our „Customers" and Cooperation Partners…

- System Houses (Siemens, Wincor Nixdorf, …)
- Communications Industry (Alcatel, Keymile, …)
- Semiconductor Industry (Fujitsu, …)
- Automotive Industry (Bosch, Hella-Aglaia, …)
- Medicine Electronics (Elfi-Tech Ltd., …)
- Production Equipment (IMS Nano, Vistec, …)
- Industrial Electronics
- Research Institutions
- many SMEs

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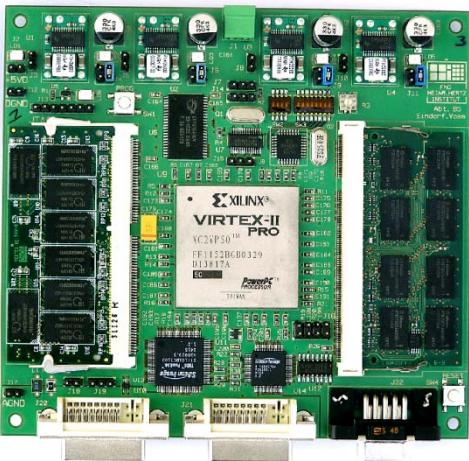
ML2 Board
(Virtex-II Pro XC2VP50 FPGA)
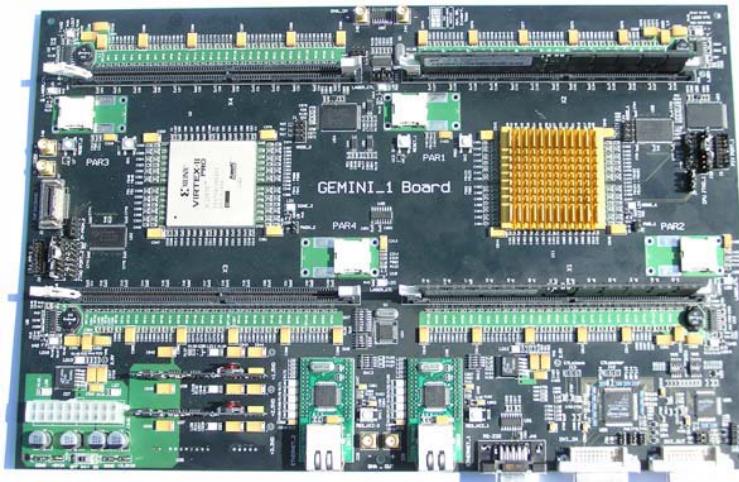
GEMINI Board (Virtex-II Pro XC2VP70 FPGA)
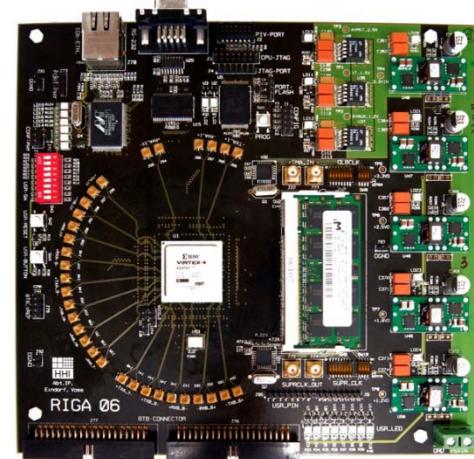
RIGA06 Board (Virtex-4 FX60 FPGA)
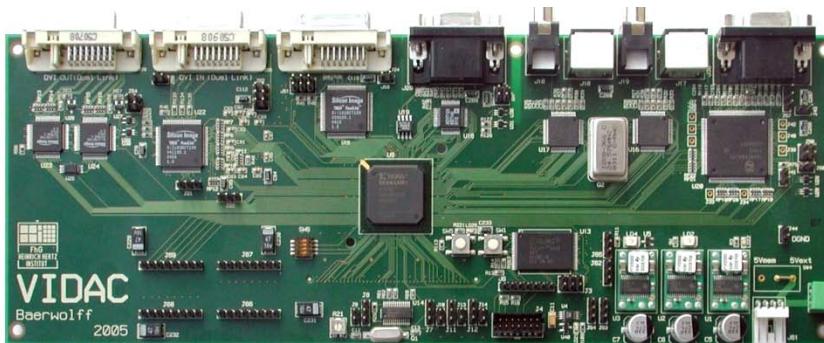
VIDAC (Video and Audio Interface) Board
(Spartan XC3S1000 FPGA)

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Parallel Optical Receiver in
0.6µm BiCMOS Technology
(36 parallel Ch. @ 2 Gbps,
600 mW power consumption)
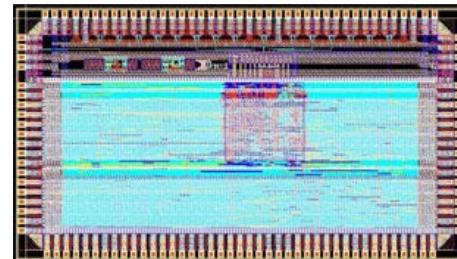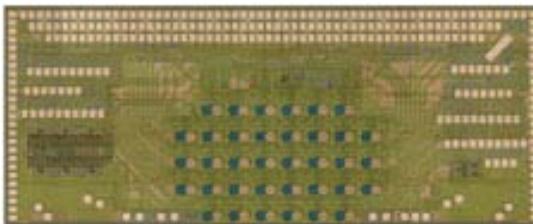
Demux and Data Processor in
0.18µm CMOS Technology
(8 parallel Ch. @ 2 Gbps,
250 mW power consumption)

OptICA Board: OptRx w/
VCSEL on ceramics & FR4
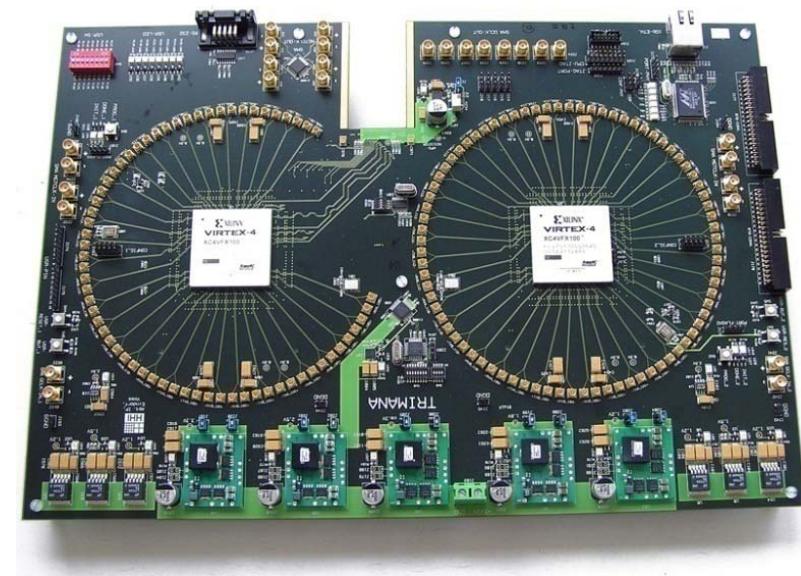
TRIMANA Board (Virtex-4 FX100)

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