

SHRIVATHSA BHARGAV

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SKILL-SET AT A GLANCE

Digital VLSI Design – Cadence Schematic, Virtuoso Layout, Analog Artist, UltraSim
Embedded Systems Design – Altera Cyclone II FPGAs (VHDL, C), Atmel/MIPS Assembly

EDUCATION

Columbia University, New York City, New York, in progress, (Expected graduation: Dec. '08)

M.S. Electrical Engineering, Current G.P.A: 3.6

Stony Brook University, Stony Brook, New York, 2003-2007

B.E. Electrical Engineering, Cumulative G.P.A: 3.51 (*Cum Laude*)

RELATED COURSES

Computer Architecture

Embedded Systems Design

Distributed Embedded Systems

Embedded Microprocessor Design

Digital VLSI Circuits

Topics in Electronic Circuits: VLSI

Digital Signal Processing

Mixed-Signals System on a Chip Design

RELATED WORK EXPERIENCE

Timing simulation and functional verification of a 16-core network-on-chip processor

(Summer 2008, Columbia Integrated Systems Lab)

- Behavioral description of system defined in VHDL and C, testbenches in VHDL
- Microarchitecture-level timing simulation in Cadence UltraSim
- Tightly-interfaced team project with tape-out deadlines

RELATED GRADUATE PROJECTS

Designing a global clock/power grid for a 16-core network-on-chip processor

- Clock was an H-tree-driven-grid, amplified from a low-swing differential signal
- Extensive use of Cadence SKILL code to automate layout of the tree and grid
- Layout (90nm), DRC, simulation and testing of the tree and grid

Designing a 4 kilobyte SRAM array with required peripheral circuitry

- High speed, dynamic logic implementation of 64x64 SRAM array
- Included read, write, and pre-charge circuitry
- From design to schematic and DRC/LVS clean layout (90nm)

Building a 128-bit AES image-decrypter on an FPGA

- Image read and decrypted from an MMC/SD-card
- Custom-built 128-bit AES decryption block
- Cycle optimized VHDL modules for decryption

Implementing an MP3 decoder on an FPGA

- Porting of open-source MP3 libraries to the Altera Cyclone II FPGA
- Discovered proper balance between software routines and hardware blocks on FPGA

Designed and implemented a Wireless Network Simulator

- Cycle-level, wireless time-synchronization simulator written in C
- Simulated advanced protocols like Reference-Broadcast Sync with Network Time Protocol in a Multi-Packet Reception environment

Removal of vocals from commercial audio tracks

- Used Audio Blind Separation techniques to detect and binary-mask specific frequencies in a time-frequency spectrogram of the chosen track
- Implemented in MATLAB

Designing a low-power, high unity-gain-bandwidth amplifier

- Concise specifications and stringent requirements, but plenty of design freedom
- Implemented and tested using 130nm BiCMOS tech in Cadence Analog/Spectre

RELATED UNDERGRADUATE PROJECTS

Designing an 8-bit microprocessor in layout

- Designed and implemented an ALU, I/O, and register file
- Simulated using testbenches in HSPICE

Building a frequency-controllable stroboscope

- Extensive use of timers and interrupts in Assembly on ATmega16 microprocessor

Programming a microcontroller as front-end for a single photon detector

- Designed and implemented high-accuracy application to log data and perform stats
- Interfaced an FPGA to an LCD user-interface on Basic Stamp2, and BasicX

OTHER RELATED PROJECTS

Programmable Logic Controller development (Visilogic)

- Dust monitor for EPA compliance in a commercial product (user-friendly design)
- Data logger in gas analyzer systems for measuring pollutants
- Remote data access through telephone dial-in / RS-232

COMPUTER SKILLS

Languages:	Cadence SKILL, VHDL, C, Assembly (Atmel/MIPS), HTML
Software:	Cadence, Quartus, PSPICE, MATLAB, MAGIC
Operating Systems:	Windows XP/Vista, Linux/UNIX (scripting), DOS (batch files)
Hardware:	Computer Networking, Hardware setup & diagnostic

ACTIVITIES/ACHIEVEMENTS

- On the Dean's List six out of eight semesters in undergraduate degree
- Awarded an undergraduate Presidential Scholarship by SUNY
- Inducted into the Alpha Tau Freshman honor society
- Member of the Golden Key honor society
- Member of the National Society for Collegiate Scholars (NSCS)
- Student member of the IEEE