

Curriculum Vitae

RESEARCH INTERESTS

- Computer Aided Design (CAD) for VLSI design and manufacturing, fast OPC algorithms and lithography modeling techniques, computational lithography, software engineering, scientific computing and synthetic biology.

EDUCATION

- 2004–present** • **Ph.D. Candidate in Computer Engineering** GPA: 4.0/4.0
Expected graduation date: May 2009
University of Texas, Austin, Texas
- 2002–2004** • **M.S. in Physics** GPA: 3.8/4.0
University of California, San Diego, California
- 1998–2002** • **B.S. in Physics** Major GPA: 89/100
Minor in Economics
Peking University, Beijing, P. R. China

EXPERIENCE

Internship:

- 05/2008–08/2008** • **Cadence Research Laboratories, Cadence, Berkeley, CA.** Developing lithography image simulations algorithms based on Abbe's formulation.
- 05/2006–08/2006** • **IBM Systems & Technology Group, IBM, Fishkill, NY.** Develop metrics, methodology and software code to measure and predict the manufacturability of VLSI designs.
- 05/2005–08/2005** • **Advanced Technology Group, Synopsys, Mountain View, CA.** Developed a lithography hotspots checker, and used it to check 90nm and 65nm designs. Investigated fast hotspot detection metrics.

Research:

- 2004–present** • **Design for manufacturability (DFM):** Developing design-intent aware OPC and new paradigms in OPC/RET. Developed a new lithography model and an OPC algorithm which take care of process variations. Developed a fast lithography simulator which was applied to a RET-aware router.
- 2003–2004** • **Low power design:** Proposed a bus encoding scheme for embedded-processor power reduction, which is confirmed by SimpleScalar simulation.
- 2002–2003** • **Parallel computation:** Implemented parallel latency-tolerant Fast Fourier Transform programs. Investigated their performances on the Blue Horizon supercomputer at San Diego Supercomputer Center and proposed a modified LogGP model to describe the performance.
- 2001–2002** • **Computational Physics:** Applied Lattice Boltzmann Equation Method to simulate the Jovian Great Red Spot. Simulated Black-eye Pattern Formation, a phenomena in a reaction-diffusion system.

Teaching:

- 2004–2005** • **EE438 Labs (Electronics lab), University of Texas** Teach undergraduate students how to use PSPICE and LabVIEW to simulate and measure circuits respectively, rated by the students as high as 4.7/5.0.
- 2003–2004** • **1-series Physics, University of California** Helped undergraduate students do freshman physics experiments interactively.
- 2003–2004** • **4-series Physics, University of California** Held homework discussion sessions and graded quizzes and finals weekly.

LIST OF PUBLICATIONS

Journal:

- 2008
- Peng Yu, Weifeng Qiu and David Z. Pan, "Fast Lithography Image Simulation By Exploiting Symmetries in Lithography Systems," accepted by *IEEE Transactions on Semiconductor Manufacturing*.
 - David Z. Pan, Peng Yu, Minsik Cho, Anand Ramalingam, Kiwoon Kim, Anand Rajaram and Sean X. Shi, "Design for Manufacturing Meets Advanced Process Control: A Survey," accepted by *The Journal of Process Control (JPC)*.
 - Peng Yu and David Z. Pan, "ELIAS: An Extensible Lithography Aerial Image Simulation Framework Using Domain Specific Language with Improved Numerical Algorithms," submitted to *ACM Transactions on Design Automation of Electronic Systems*.
- 2007
- Peng Yu, Sean X. Shi and David Z. Pan, "True Process Variation Aware Optical Proximity Correction with Variational Lithography Modeling and Model Calibration," *Journal of Micro/Nanolithography, MEMS and MOEMS*, Vol. 6, no. 3, 031004, July-September 2007, selected for *Virtual Journal of Nanoscale Science & Technology*, September 24, 2007.

Conference:

- 2008
- Peng Yu, Xi Chen, David Z. Pan and Andrew D. Ellington, "Synthetic Biology Design and Analysis: a Case Study of Frequency Entrained Biological Clock," *Proc. IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, November, 2008.
 - Peng Yu, Xi Chen, David Z. Pan and Andrew D. Ellington, "Synthetic Biology Design and Analysis: a Case Study of Frequency Entrained Biological Clock," *Synthetic Biology 4.0*, October, 2008.
- 2007
- Peng Yu, and David Z. Pan, "TIP-OPC: A New Topological Invariant Paradigm for Pixel Based Optical Proximity Correction," *Proc. ACM/IEEE International Conference on Computer-Aided Design (ICCAD)*, November, 2007.
 - Peng Yu, and David Z. Pan, "A Novel Intensity Based OPC Algorithm with Speedup in Lithography Simulation," *Proc. ACM/IEEE International Conference on Computer-Aided Design (ICCAD)*, November, 2007.
 - Peng Yu, and David Z. Pan, "TIP-OPC: A New Topological Invariant Paradigm for Pixel Based Optical Proximity Correction," *Proc. SRC Techcon Conference*, September, 2007.
 - Peng Yu, David Z. Pan, "Fast Predictive Post-OPC Contact/Via Printability Metric and Validation," *Proc. SPIE Optical Microlithography XX*, San Jose, CA, February 2007.
- 2006
- Sean X. Shi, Peng Yu and David Z. Pan, "A Unified Non-Rectangular Device and Circuit Simulation Model for Timing and Power", *Proc. IEEE/ACM Int'l Conference on Computer-Aided Design (ICCAD)*, November, 2006.
 - Peng Yu, Sean X. Shi, and David Z. Pan, "Process Variation Aware OPC with Variational Lithography Modeling," *DAC'06: Proceedings of the 43rd Annual Design Automation Conference*, San Fransisco, CA, July 2006.
 - Peng Yu, David Z. Pan and Chris A. Mack, "Fast Lithography Simulation Under Focus Variations for OPC and Layout," *Proc. SPIE: Design and Process Integration for Microelectronic Manufacturing IV*, San Jose, CA, February 2006.
- 2005
- Joydeep Mitra, Peng Yu and David Z. Pan, "RADAR: RET-Aware Detailed Routing Using Fast Lithography Simulations," *DAC'05: Proc. 42nd Annual Design Automation Conference*, Anaheim, CA, June 2005.
 - Joydeep Mitra, Peng Yu and David Z. Pan, "RADAR: RET-Aware Detailed Routing", *Electronic Design Process (EDP) Workshop*, Monterey, California, April 2005.

Patent:

- 2007
- Zhigang Pan and Peng Yu, "Method and System for Performing Optical Proximity Correction with Process Variation Considerations", US Patent Application 11/923,927.

COURSE BACKGROUND

- Semiconductor Microlithography, VLSI Fabrication Techniques, VLSI Physical Design Automation, Optimization Issues in VLSI CAD, Nanometer IC Design, Engineering Programming Language, VLSI Testing, Logic Synthesis, Computer Architecture.

HONORS

- 2008
- BioBricks Foundation SB4.0 Travel Award, Synthetic Biology 4.0

HONORS (continued)

- **Inventor Recognition Award**, Semiconductor Research Corporation (SRC)
- **William H. Hildebrand Endowed Graduate Fellowship**, the University of Texas
- **BACUS Photomask Scholarship**, Society of Photographic Instrumentation Engineers (SPIE)
- 2007** • **IBM PhD Fellowship Nominee**, ECE Department, the University of Texas (only two nominations from the ECE department)
- 2005** • **DAC Young Student Support Program Award**, Design Automation Conference
- 2000** • **Brilliance Scholarship**, Peking University
- 1999** • **Gangsong Scholarship**, Peking University
- 1998** • **Freshman Scholarship**, Peking University
- 1997** • **Second Prize**, Chinese Physics Olympiad (CPhO), Chinese Physical Society
- **Top Prize**, CPhO in Henan Province, Chinese Physical Society
- 1996** • **First Prize**, CPhO in Henan Province, Chinese Physical Society

TECHNICAL SKILLS

- Languages:** • Mastery and daily use of C++. Other languages: C, Java, FORTRAN, 80x86 Assembly, HTML. Scripts and tools: GNU Make, Linux shells, Python, Perl.
- Extensive experience of typesetting languages: \LaTeX , \TeX .
- Libraries:** • Expert knowledge of **Boost C++ Libraries**, **Standard Template Library (STL)**, **Message Passing Interface (MPI)**, **CLAPACK**, **FFTW**. Working knowledge of Intel Math Kernel Library (MKL), Open Graphics Library (OpenGL)
- Systems:** • Mastery and daily use of different Unix systems: **Linux**, **cygwin**, Solaris, IBM AIX. Others: **Windows 2000/NT/XP**
- Others:** • **Mathematica**, **MATLAB**, **gnuplot**