

# Zigang Xiao (Ivan)

*Curriculum Vitae* (as of February 18, 2014)

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## Objectives & Interests

I am a PhD student looking for summer intern (2014) as a software engineer or research scientist, preferably the backend positions where I can utilize my expertise in Software Development, Machine Learning, Computer Vision or Design Automation.

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## Education

- 8/2010–1/2015 (expected) **Ph.D. Candidate**, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign (UIUC), Urbana, IL, USA. [GPA: **3.87/4.0**]
- 8/2008–8/2010 **Master of Philosophy**, Department of Computer Science and Engineering, The Chinese University of Hong Kong (CUHK), Hong Kong. [GPA: **3.9/4.0**]
- 9/2004–7/2008 **Bachelor of Science**, Department of Computer Science, Sun Yat-Sen University (SYSU), Guangzhou, China. [GPA: **3.9/4.0**, Ranking: **1/200**, graduated with outstanding honor]

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## Professional Skills

- Languages (proficient): C/C++, Matlab, Python, Bash scripting
- Languages (prior experience): Java, Obj-C, Ruby, Lua, JavaScript & HTML, x86 asm
- Softwares: gcc, gdb, make, cmake, git, vim, awk, sed, grep, Visual Studio, Eclipse
- Operating systems: Linux, OS X, Windows

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## Industrial Experience

- 5/2013–8/2013 **R&D Engineer Intern**, *Synopsys Inc.*, 700 E Middlefield Rd, Mountain View, CA 94043.  
I worked in Zroute Team, Implementation Group and involved in the router development for IC Compiler.
- 5/2012–8/2012 **CAD Engineer Intern**, *NVIDIA Corporation*, 2701 San Tomas Expy, Santa Clara, CA 95050.  
I worked in DFT/CAD Team and involved in developing internal tools for scan chain flow.
- 3/2008–6/2008 **Software Engineer Intern**, *Ericsson Mobile Data Applications Tech R&D*, Guangzhou, China.  
Prototyping PKI/CA system.

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## Teaching Experience

- 1/2013–current **Teaching Assistant**, *Department of CS, UIUC*, Urbana, IL.  
MOOC course: *VLSI CAD: Logic to Layout*. Available online at [www.coursera.org/course/vlsicad](http://www.coursera.org/course/vlsicad).  
Taught by Prof. Rob Rutenbar, head of CS department. More than 17, 000 students registered in 2013.
- 1/2012–current **Teaching Assistant**, *Department of ECE, UIUC*, Urbana, IL.  
- ECE 425 (FA 12/13), Intro to VLSI Sys. Design      - ECE 411 (SP '11), Computer Architecture
- 8/2008–8/2010 **Teaching Assistant**, *Department of CSE, CUHK*, Hong Kong.  
- CSC 3120 (SP '10), Compiler Construction      - CSC 3190 (FA '09), Discrete Math and Algos  
- CSC 4430 (SP '08), Computer Networks      - CSC 3150 (FA '08), Intro to Operating System

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## Research Experience & Selected Projects

- current **Direct Self-Assembly (DSA) Template Verification**, *Research*, C++, Matlab, 2000 lines.  
We utilized various computer vision and machine learning techniques to build a DSA template classifier that can achieve up to 85% accuracy. This is the first work for the related problem.
- current **Self-Aligned Double Patterning layout decomposition**, *Research*, C++, CGAL, 5000 lines.  
- We proposed a graph-coloring based algorithm that optimally finds a no-overlay decomposition in polynomial time, while previous approaches adopted exponential time methods.  
- We further proposed a shortest-path based algorithm that utilizes the characteristics of standard cell row-based layout and solves the problem efficiently in polynomial time.
- 1/2013–5/2013 **Reference Placer, Router and Graders**, *for MOOC course*, C++, 3000 lines.  
I developed an analytical placer and a maze router as reference programs, and corresponding auto-graders.
- 1/2012–5/2012 **Carcassonne Board Game Scorer**, *Course Project for Computer Vision*, Matlab, 1000 lines.  
I developed a program that automatically computes the score from a picture of a Carcassonne boardgame.
- 8/2011–12/2011 **Music Genre Classification**, *Course Project for Machine Learning*, Java, Weka, 1000 lines.  
I implemented an algorithm flow that automatically classifies music genres from songs.
- 3/2011–1/2012 **Algorithms for Routing Reliability Problem**, *Research*, C++, BGL, 2000 lines.  
We developed a two-stage algorithm for Routing Reliability Problem. The 1st stage generates a set of candidate augmenting segments, The 2nd stage optimally selects the segments by dynamic programming.
- 11/2010–3/2011 **Large-scale Powergrid Simulation**, *Research*, C++, UMFPACK, 3000 lines.  
Developed a powergrid simulator that can solve powergrid in the scale of millions of nodes in minutes.
- 8/2008–5/2010 **Physical design algorithms for biochips**, *Research*, C++, 3000 lines.  
I designed a graph-coloring based routing algorithm that routes droplet in cross-referencing biochips without cross-contamination; and a ILP-based placement algorithm that solves 3D placement for biochips.
- 1/2009–1/2010 **Clock Network Synthesis**, *Research*, C++, 10000 lines.  
We developed a clock network synthesis algorithm that is robust against process variation. Our team won the 2nd and 4th places in ISPD 2010 and 2009 Clock Network contest, respectively.

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## Selected Courses

- ECE490 Introduction to Optimization (A+) - CS543 Computer Vision (A+)
- ECE425 Intro to VLSI System Design (A+) - CS446 Machine Learning
- CS598CSC Approximation Algorithms - ECE582 Physical VLSI Design
- CS573 Algorithms (Graduate) - ECE552 Numerical Circuit Analysis
- UPCRC 2011 Parallel Programming Summer School
- CEG5270 CAD for Physical Design - CEG5330 Logic Synthesis and Testing
- CSC5240 Combinatorial Search & Optimization - CSC5350 Game Theory in Computer Science

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## Professional Service

**Reviewer**, *IEEE Transaction on CAD of Integrated Circuits and Systems (TCAD)*, *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, *Integration: the VLSI Journal*.

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## Honors and Awards

- 2010 Second place in ISPD 2010 High Performance Clock Network Synthesis Contest
- 2009 Fourth place in ISPD 2009 Clock Network Synthesis Contest
- 2008 SYSU Outstanding Graduate Award, Outstanding Thesis Award
- 2008 First places in Guangdong and SYSU Computer Programming Contest (GDCPC '08, ZSUCPC '08)
- 2007, 2006, 2005 First place in Academic Excellence Award in SYSU (top 5%)
- 2006 Third place in SYSU Computer Programming Contest (ZSUCPC '06)