

Ming GAO

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OBJECTIVE

To obtain a full-time summer internship on verification, validation, and testing of System-on-a-Chip

EDUCATION

PhD in Computer Engr. DEPT. OF ECE, UNIVERSITY OF CALIFORNIA, SANTA BARBARA, USA, 2006 - PRESENT
Research Topic: Design for Resilience in Cost-sensitive SoCs
Research Advisor: Professor Kwang-Ting (Tim) Cheng
MS in Systems Engr. SYSTEMS ENGINEERING INSTITUTE, XIAN JIAOTONG UNIVERSITY, CHINA, 2003 - 2006
Research Interests: Network Security, SoC Design. (Exempt from entrance exam, Rank: 2/48)
Research Advisor: Chung Kong Professor Xiaohong Guan
Thesis Title: *Key Technology for High-Speed Network Intrusion Detection on SoPC*
BS in Information Engr. DEPT. OF INFORMATION ENGR., XIAN JIAOTONG UNIVERSITY, CHINA, 1999 - 2003
Study Emphasis: Telecommunication and Signal Processing
Thesis Advisor: Professor Zuren Feng
Thesis Title: *A Single-eye Vision-based Localization System for Autonomous Robots*

RESEARCH INTERESTS

- Verification, Post-silicon Validation, Testing for SoC
- In-field and/or Online Testing and Self-Repair for SoC/NoC
- Cost-/Power-efficient Application/Domain Specific Computing

SELECT PUBLICATIONS

- M. Gao, H.M. Chang, P. Lisherness, K.T. Cheng, "Time-Multiplexed Online Checking," under review of IEEE TC Special Issue. 2010
- M. Gao and K.T. Cheng, "Low Overhead Time-Multiplexed Online Checking: A Case Study of an H.264 Decoder," in Proceedings of the 18th Asian Test Symposium (ATS'09). IEEE Computer Society, Taichung, Taiwan. 2009.
- M. Gao, H.M. Chang, P. Lisherness, K.T. Cheng, "Time-Multiplexed Online Checking: A feasibility study," in Proceedings of the 17th Asian Test Symposium (ATS'08). IEEE Computer Society, Sapporo, Japan. 2008.
- M. Gao, K. Zhang, J. Lu, "Efficient Packet Matching for Gigabit Network Intrusion Detection using TCAMs," pp. 249-254, 20th International Conference on Advanced Information Networking and Applications (AINA'06), 2006.
- M. Gao, K. Zhang, J. Lu, X. Guan, "A gigabit network intrusion detection system solution based on partial match," China Network and Information Security Technology Conference (NetSec'05), Beijing, P.R.China, Aug. 2005. (In Chinese)

RESEARCH PROJECTS

- **Time-Multiplexed Online Checking (TMOC) for Cost-Sensitive SoCs, UCSB 2007 - 2009**

Sponsor: Resilient Theme, Gigascale Systems Research Center (GSRC, www.gigascale.org)

Keywords: Online Testing, Error Detection, Reconfigurable Checker.

Tools: Xilinx ISE, XPS, XSG; Matlab, Simulink; ModelSim; SoC Encounter; Design Compiler; Certify, Synplify Pro.

Motivation: Reduce online checking overhead and improve product in-field availability for cost-sensitive SoCs.

Methodology: Multiple sub-systems temporarily share one reconfigurable checker space.

Demo: An FPGA demo using TV-to-VGA decoder on Xilinx XUP system: <http://cadlab.ece.ucsb.edu/~mgao/tmoc>

- **NetFPGA Case Study: A P2P Traffic Monitor for Multi-Gigabit Router, Xilinx China, Summer 2008**

Motivation: Demonstrate the efficiency of NetFPGA to Asian networking research community.

Methodology: A header-and-payload matching based P2P flow identifier with firewall in a gigabit router inside NetFPGA.

Demo: I lead a workshop for NetFPGA user community in Xilinx Shanghai. http://www.openhw.org/project/view_240.html

● **Signature Matching Offload Engine for High Speed Network Intrusion Detection, XJTU 2004 - 2006**

Sponsor: China Hi-Tech Research and Development Program (“863” Program)

Keywords: High Speed Networking, Intrusion Detection, Pattern Recognition;

Tools: Xilinx ISE, EDK; Synplify Pro; ModelSim; libSVM; Visual Studio.

Motivation: Leverage XJTU-IDS system for Gigabit links using application specific hardware architectures.

Methodology: A multi-gigabit HW signature matching offload engine using proposed cascaded TCAM technique.

Demo: An FPGA prototype system on Xilinx ML310 evaluation board.

SELECT AWARDS

- Best Dissertation of MS in Systems Engineering, Systems Engineering Institute, XJTU, 2006;
- Hu Fellowship for excellent students in Systems Engineering Institute, XJTU, 2006.
- Rockwell Automation Outstanding Student Award 2004 (one of the five winners all over the university);
- Second-place award, the 11th TengFei Cup technology innovation competition, XJTU, 2004;
- Excellent award, College Student Software Design Contest by “863 Program Computer Science Theme”, Xian, 2004;
- Excellent award, Asia-Pacific Broadcasting Union College Student Robot Contest (Robocon), Beijing, 2003;
- Third-place award, GE Foundation Edison Cup Technology Innovation Competition, 2003;
- Best paper award, the first XJTU undergraduate student international symposium, 2003;
- Shanghai ZhongYing Electronics Scholarship for excellent electronics engineering students, 2003;
- First-place in Northwest China, Excellent Award in national final, NOKIA Originality Competition, 2002.

WORKING EXPERIENCE

- NetFPGA Project and Workshop Leader, Summer Internship at Xilinx China, 07/2008 – 09/2008
- Graduate Student Researcher, Design and Test Lab, ECE Department, UCSB, fall 2006 – Present
- Teaching Assistant, ECE 15B -- Computer Organization, UCSB, spring 2007.
- Thesis and Project Mentor of two senior EE students, XJTU, Dec. 2005 to June 2006.

ACADEMIC MEMBERSHIPS

- IEEE Student Member (2006 - Present)
- ACM SIGDA Student Member (2007 - Present)

REFERENCES

Available upon request

LANGUAGES

Chinese (Mandarin), native language

English, fluent and literate