

# BEHNAM ROBATMILI

## CURRICULUM VITAE

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### ADDRESS

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### RESEARCH INTERESTS

Designing high performance computer architecture (Superscalar, Spatially Partitioned, Multi-processors, SMT ...) and improving compilers for new architectures. Improving single-thread performance by extracting implicit parallelism in a grid of composable cores.

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### EDUCATION

PhD in the University of Texas at Austin (GPA 3.9) (11/2011)  
Computer Science Department  
Supervisor: Prof. Doug Burger

M.S. in the University of Tehran, Iran (GPA: 4.0) (2/2004)  
Computer Engineering Department  
Supervisor: Prof. Nasser Yazdani

B.S. in the University of Tehran, Iran (6/2001)

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### RESEARCH EXPERIENCE

8/2005–present **Graduate Research Assistant**  
Advisor: Doug Burger

- 8/08–present I developed a critical path tool for the TFlex composable multicore system. Using this tool, I was able to determine which components are the performance bottlenecks in each system configuration.
- 10/08–present I collaborated in developing a hybrid token-based/broadcast/register instruction communication model in modern processors to improve power consumption in the bypass logic significantly while achieving decent speedup.
- 10/07–9/08 I developed a hardware block mapper in TFlex simulator, to evaluate several strategies for mapping instructions to a distributed substrate of cores.
- 4/07–4/08 I collaborated in using reinforcement learning to improve instruction placement heuristics. We showed that for individual benchmarks major speedups are possible when tuning the instruction placement phase using a reinforcement learning algorithm.
- 2/06–12/07 I implemented a register bank allocator for the TRIPS prototype processor. The goal of this bank allocator was to reduce the critical path delay of programs running on distributed TRIPS tiles (register file and execution tiles).
- 3/07–9/07 Working with another student, I implemented a high performance matrix multiply on the TRIPS prototype processor. Using Goto's BLAS model as our high level, we developed a very optimized assembly core.

3/06–5/07 I worked on TRIPS Resource Manager (TRM) which is a server application that supports multiple users connected to multiple TRIPS boards.

8/2001–8/2005 **Research Assistant**

Router Laboratory, University of Tehran

Advisor: Nasser Yazdani

I studied different architectures and instruction formats for network processors. I developed a simulator called NPSMT with an optimized instruction set for Network Processing. I also designed special functional units for queuing and hashing used for network processing.

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## SELECTED PUBLICATIONS

Mark Gebhart, Bertrand A. Maher, Katherine E. Coons, Jeff Diamond, Paul V. Gratz, Mario Marino, Nitya Ranganathan, **Behnam Robatmili**, Aaron Smith, James Burrill, Stephen W. Keckler, Doug Burger, Kathryn S. McKinley, An Evaluation of the TRIPS Computer System. The 14th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '09). Washington, DC. March, 2009.

**Behnam Robatmili**, Katherine E. Coons, Doug Burger, Kathryn S. McKinley. Strategies for Mapping Dataflow Blocks to Distributed Hardware. The 41st Annual IEEE/ACM International Symposium on Microarchitecture. Lake Como, Italy. November, 2008.

Katherine E. Coons, **Behnam Robatmili**, Matthew E. Taylor, Bertrand A. Maher, Doug Burger, Kathryn S. McKinley. Feature Selection and Policy Optimization for Distributed Instruction Placement Using Reinforcement Learning. The Seventeenth International Conference on Parallel Architectures and Compilation Techniques (PACT). October, 2008.

**Behnam Robatmili**, Katherine E. Coons, Doug Burger, Kathryn S. McKinley. Register Bank Assignment for Spatially Partitioned Processors. Languages and Compilers for Parallel Computing (LCPC) 21st Annual Workshop. July, 2008.

**Behnam Robatmili**, Katherine E. Coons, Doug Burger. Balancing Local and Global Parallelism for Single-Thread Applications in a Composable Multi-Core System. 2008 Workshop on Parallel Execution of Sequential Programs on Multi-core Architectures. June, 2008.

Jeff Diamond, **Behnam Robatmili**, Stephen W. Keckler, Kazushige Goto, Doug Burger and Robert van de Geijn. High Performance Dense Linear Algebra on Spatially Partitioned Processors. Symposium on Principles and Practice of Parallel Programming (PPOPP), February, 2008.

Matthew E. Taylor, Katherine E. Coons, **Behnam Robatmili**, Doug Burger, and Kathryn S. McKinley. Policy Search Optimization for Spatial Path Planning. In NIPS-07 workshop on Machine Learning for Systems Problems, December 2007. (Two page extended abstract.)

**Behnam Robatmili**, Nasser Yazdani, Mehrdad Nourani. Optimizing SMT Processors for Packet Processing. Microprocessors and Microsystems, Volume 29, Issue 7, 1 September, 2005, pp 337-349 .

**Behnam Robatmili**, Nasser Yazdani, Somayeh Sardashti, Mehrdad Nourani. Thread-Sensitive Instruction Issue for SMT Processors. IEEE Computer Architecture Letters, Volume 3, August, 2004.

Hossein Mohammadi, **Behnam Robatmili**, Nasser Yazdani, Mehrdad Nourani. HASIL: Hardware Assisted Software-based IP Lookup for Large Routing Tables. 11th IEEE International Conference on Networking (ICON'2003), Sydney, Australia, pp 99-105, Sep. 2003.

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## TEACHING EXPERIENCE

- 8/2005-11/2006 **Teaching assistant**  
University of Texas Department of Computer Science  
Computer Architecture course.
- 1/2007-4/2008 **Teaching assistant**  
University of Texas Department of Computer Science  
Computer Architecture course.
- 8/2000-8/ 2003 **Teaching assistant**  
University of Tehran ECE Department  
Compiler course.

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## HONORS

- 2004 **First Rank** among the graduation class, Department of Electrical and Computer Engineering, University of Tehran, Tehran, Iran
- 2002 **Certificate of Recognition** for excellent contribution to coaching and organizing ACM ICPC (International Collegiate Programming Contest) University of Tehran Teams

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## OTHER ACTIVITIES

- 2009 **Reviewer**, The International Conference for Supercomputing (ICS09)
- 2007 **Reviewer**, The International Conference for High Performance Computing, Networking, Storage and Analysis (SC07)
- 2005 **Reviewer**, IEEE Computer Magazine.
- 2007-2008 **Student Organization Officer**, University of Texas at Austin, Persian Student Society.

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## REFERENCES

These persons are familiar with my professional qualifications and my character:

**Doug Burger**

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University of Texas at Austin  
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