

# Muhammad Faisal Iqbal

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## Education

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| <b>University of Texas at Austin</b><br><i>PhD,</i>  | <b>Austin, TX</b><br>2009–2013  |
| <b>University of Texas at Austin</b><br><i>MS, Computer Engineering,</i>                         | <b>Austin, TX</b><br>2007–2009  |
| <b>GIK Institute of Engineering Science and Technology</b><br><i>BS, Electronic Engineering,</i> | <b>Topi, Swabi</b><br>1999–2003 |

## PhD Thesis

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**Title:** *Workload Aware Network Processors: Improving Performance while Minimizing Power Consumption*

**Supervisor:** Prof. Lizy Kurian John

**Dissertation Committee:** Prof. Earl Swartzlander (UT, Austin), Prof. Gustavo de Veciana (UT, Austin), , Dr. James Holt (MIT, Freescale), Prof. Andreas Gerstlauer (UT, Austin), Dr. Byeong Kil Lee (Samsung)

**Description:** Network Processors are multicore processors capable of processing network packets at wire speeds of multi-Gbps. The dissertation presents microarchitecture and system level techniques to improve the performance and minimize power consumption in these multicore processors. Microarchitecture techniques include packet scheduler and resource manager which leverages multiple dimensions of locality and properties of network traffic to improve throughput. Design of a system level power manager is also presented which uses traffic behavior to minimize power consumption.

## Research Interests

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Computer Architecture, Parallel Computer Architecture, Network Processor Architecture, Computer Performance Evaluation and Benchmarking

## Teaching Interests

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**Undergraduate:** Computer Architecture, Algorithms, Operating Systems, Logic Design, Programming in C++, Statistics and Probability, Computer Networks

**Graduate:** Parallel Computer Architecture, Superscalar Processor Architecture, Computer Performance Evaluation and Benchmarking

## Experience

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### **National Engineering and Scientific Commission**

*Manager (Embedded Systems)*

Leading a team of engineers responsible for FPGA based digital system design of various military and industrial projects

**Islamabad**

*2013–present*

### **University of Texas at Austin**

*Teaching Assistant*

Assisted the instructor in preparation of lecture material and grading of assignments and exams. Responsible for the design and testing of all lab projects

**Austin, TX**

*2009–2013*

Courses taught:

- Digital Logic Design
- Computer Performance Evaluation and Benchmarking
- Superscalar processor architecture

### **Qualcomm Inc.**

*Logic Design and Performance Evaluation Intern*

Responsible for the design of Load Store Unit in hexagon processor used in Snapdragon chipset. Also wrote performance test benches for hexagon processor

**Austin, TX**

*Summer 2012*

### **ViXs Systems Inc.**

*Performance Modeling Intern*

Developed a cycle accurate model for a multi format video encoder in C++

**Austin, TX**

*Summer 2009*

### **National Engineering and Scientific Commission**

*Assistant Manager*

**Islamabad**

*2003–2007*

## Awards and Achievements

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- Scholarship awarded by HEC for Masters leading to PhD program in USA, 2009.
- Talent scholarship awarded by Misnistry of Sceince and Technology for undergraduate program at GIK Institute, 2000.
- Gold medal awarded by BISE, Bahawalpur for first position in the board, 1999.

## Publications

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[1]Jee Ho Ryo, Michael LeBeane, Muhammad Faisal Iqbal, and Lizy Kurian John. Control flow behavior of cloud workloads. In *The IEEE International Symposium on Workload Characterization, IISWS '14*, Raleigh, North Carolina, USA, 2014. IEEE.

[2]Dimitris Kaseridis, Muhammad Faisal Iqbal, and Lizy K. John. Cache friendliness aware management of last-level caches for high performance multi-core systems. *IEEE Transactions on Computers (TC)*, January 2013.

[3]Muhammad Faisal Iqbal, Jim Holt, Jee Ho Ryoo, Gustavo de Veciana, and Lizy Kurian John. Flow migration on multicore network processors: Load balancing while minimizing packet reordering. In *Proceedings of the 2013 International Conference on Parallel Processing, ICPP '13*, Lyon, France, 2013. IEEE Computer Society.

[4]Muhammad Faisal Iqbal and Lizy Kurian John. Traffic aware power management in communications processors. In *Semiconductor Research Corporation Technology Conference, TECHCON '12*, 2012.

[5]Muhammad Faisal Iqbal and Lizy Kurian John. Power and performance analysis of network traffic

prediction techniques. In *IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS), 2012.*, pages 112–113, 2012.

[6] Muhammad Faisal Iqbal and Lizy Kurian John. Efficient traffic aware power management in multicore communications processors. In *Proceedings of the Eighth ACM/IEEE Symposium on Architectures for Networking and Communications Systems, ANCS '12*, pages 123–134, New York, NY, USA, 2012. ACM.

[7] Dimitris Kaseridis, Muhammad Faisal Iqbal, Jeoff Stuechelli, and Lizy John. Mcfq: Leveraging memory level parallelism and application's cache friendliness for efficient management of quasi partitioned last-level caches. In *Parallel Architecture and Compilation Techniques, PACT '11*, 2011.

[8] Muhammad Faisal Iqbal and Lizy Kurian John. Confusion by all means. In *Workshop on Unique Chips and Systems, UCAS-6*, 2010.

[9] Junaid Haroon Siddiqui, Muhammad Faisal Iqbal, and Derek Chiou. Parallel assertion processing using memory snapshots. In *Workshop on Unique Chips and Systems, UCAS-5*, 2009.

[10] M. M. Ahmed, N. Ahmed, K.S Chaudhary, and Muhammad Faisal Iqbal. Estimation of intrinsic small signal parameters of gaas mesfet from dc measurements. In *IEEE INMIC, INMIC-2001*, 2001.