HARSHAD DESHMUKH

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AREAS OF INTEREST

Query scheduling, Resource management, Main memory database systems

EDUCATION

- **PhD**, Computer Sciences (Database Systems) (Expected December 2018)
  – Advisor: Prof. Jignesh M. Patel
  – University of Wisconsin - Madison
- **Master of Science**, Computer Sciences (Aug 2012 - May 2014)
  – University of Wisconsin - Madison
- **M.Sc.** Mathematics and **B.E.** Computer Science (Aug 2006 - Jun 2011)
  – Birla Institute of Technology and Science (BITS), Pilani, India

RESEARCH EXPERIENCE

- **Adaptive Concurrent Query Scheduler For Quickstep Database System** (Under submission)
  – Developed an adaptive, and responsive database scheduler for concurrent queries.
  – The scheduler separates resource sharing policies from mechanisms using a probabilistic framework.
  – Demonstrated the effectiveness of policies such as fair, highest priority first and proportional priority.
  – **Contributions:** 1st author, formulation of ideas with Prof. Patel and implementation of the scheduler.

- **Quickstep: A High Performance Data Platform based on a Scaling-In Approach** (Under submission)
  – Described the Quickstep database system developed with a scaling-in design philosophy.
  – Showcased the adaptive nature of the query scheduler by flexibly changing CPU resources while the query is in progress.
  – Demonstration of a query progress monitor highlighting live statistics including degree of parallelism of relational operators, execution times etc.
  – **Contributions:** Co-author with Quickstep colleagues, design and performing experiments, profiling query execution, and optimizing query execution performance.

PROFESSIONAL EXPERIENCE

- *Research Assistant*, Database Systems Group, UW - Madison (Since Jan 2013)
  – Working on **Quickstep**, a Main Memory Database System with Prof. **Jignesh M. Patel**
  – Designing and building a dynamic **query scheduler** for multi-threaded execution of relational queries

- *Intern*, Pivotal Inc., Palo Alto, California (3 months from June 2015)
  – Joined as a part of the acquisition of Quickstep Technologies by Pivotal Inc.
  – Continued development of Quickstep system working jointly with the employees of Pivotal Inc.

- *Research Intern*, Samsung Semiconductors, Milpitas, California (3 months from May 2014)
  – Worked on optimizing **SSDs** (Solid-state drives) for **data management systems**
  – Studied intricate details of SSD functionalities and applied them for efficient data management
  – Precise details not mentioned due to confidentiality agreement

- *Engineer IT*, Cisco Systems, Bangalore, India (11 months from Jul 2011)
  – Developed **Web Services** based on **Service Oriented Architecture** methodology
  – Used Apache CXF framework, J2EE and SQL for back-end development
  – Contributed in developing an Ontology application using SPARQL, Oracle RDF data store

- *Student Intern*, RSA Security at EMC, Bangalore, India (6 months from Jan 2011)
  – Worked on Digital Certificate importing modules in **RSA Data Protection Manager**
  – Implemented Certificate Management Protocol in **Java** using RSA BSAFE APIs

Academic Projects

- **Complex Event Processing**
  – Analyzed the scalability of and developed SQL like queries for Storm from Twitter
  – Evaluation with varying workload on a simulated distributed system to analyze the throughput and memory footprint

- **Indexing and Regular Expression Search for Text Documents in *Quickstep***
  – Facilitated bulk loading of text documents and built a Posting List Index on top of them
  – Implemented keyword and regular expression search for the text documents using RE2, an open source library

- **Database System Implementation using XML**
  – Analyzed the merits of XML in representing data in an object-relational model and implementing a generic model for storing object-relational data
  – Designed a new database system's concurrency and crash recovery management features

- **Simulation of Traffic Flow using Cellular Automata Model**
  – Studied various Cellular Automata models for road traffic
  – Designed simulations using Python based GUI to demonstrate rules given by Cellular Automata about acceleration, velocity and displacement for vehicles

Skill Sets

Programming languages	C++, Python, Shell scripting, , Java, C
Data management	MySQL, MonetDB, HBase, LevelDB
Development environments	VIM, Eclipse based IDEs
Web technologies	JSP, JavaScript, CSS/HTML, PHP, ASP.NET, Django
Publishing	LaTeX, Microsoft Word, Open Office

Awards and Recognitions

- Multiple **Cisco Star** and **Spark** awards for excellent technical contribution at Cisco Systems
- Ranked in top 30 students in **Indian Mathematics Olympiad** from Maharashtra and Goa states in India
- Certified in **Oracle Database 11g** - Oracle Certification 1Z0-051 on SQL Fundamentals
- **Summer Research Fellowship** from Indian Academy of Science
- **Merit cum Need Scholarship** for consistent academic performance at BITS Pilani

PRESENTATIONS

- **Dynamic Rerouting in Vehicular Ad-Hoc Networks** at **IBM Research Lab**, New Delhi
  –Proposed a dynamic rerouting algorithm using Ant Colony Optimization to beat traffic congestion

- **Road Traffic Simulation using Cellular Automata** and **Swarm Intelligence** at APOGEE
  –APOGEE is the annual technical festival held in BITS Pilani
  –Simulated road traffic scenarios in Python based GUI.

EXTRA CURRICULAR

- **Seminar Coordinator**, Database Group, UW Madison (`http://database.cs.wisc.edu/seminar.html`)
- **Moderator**, BITS2MSPhD (`http://groups.yahoo.com/group/bits2msphd/`) - A forum for BITS students interested in Masters/PhD
- **Member of Steering Committee**, Award for Excellence in Computer Science - An award for undergraduates in BITS Pilani (`http://aecs.bits-csa.org/`)
- **Coordinator**, Communication Cell, BITS Embryo (`http://embryo.bits-pilani.ac.in`)
- **Vice President**, Maharashtra Mandal - a cultural group in BITS Pilani
- **BITSAA International Leader** - for BITS Alumni Association (BITSAA)