

## AREAS OF INTEREST

Query Scheduling, Resource Management, In-memory Database Systems

## EDUCATION

- **PhD**, Computer Sciences (Database Systems) (Expected May 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

## PUBLICATIONS

- **Adaptive Concurrent Query Scheduler For Quickstep Database System** (IEEE BigData Congress 2017)
  - 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
  - Winner of the best student paper award
- **Quickstep: A High Performance Data Platform based on a Scaling-Up Approach** (VLDB 2018)
  - Described the Quickstep data platform developed with a scaling-up design philosophy
  - Showcased the adaptive nature of the query scheduler by flexibly changing CPU resources while the query is in progress
  - Demonstrated query progress monitoring to get statistics such as degree of parallelism of relational operators and their execution times
  - **Contributions:** Co-author with Quickstep colleagues, designing and performing experiments, profiling query execution, and optimizing query execution performance
- **Making a Case for In-memory Database Scheduler** (Under preparation)
  - Demonstrating the benefits of having a separate query scheduler component
  - Making a clear distinction between query optimizer and query scheduler
  - Analyzing various intra-query scheduling policies and their performance characteristics
- **Determining Data Locality in a Distributed System using Aggregation of Locality Summaries** (Patent pending)

## PROFESSIONAL EXPERIENCE

- *Research Assistant*, Database Systems Group, UW - Madison (Since Jan 2013)
  - Working on Apache (incubating) **Quickstep** database system with Prof. **Jignesh M. Patel**
  - Designing and building a dynamic **Query Scheduler** for multi-threaded execution of relational queries

- *Research Intern*, CISL, Microsoft, Sunnyvale, California (3 months from May 2017)
  - Worked on designing **self regulating Stream Processing systems** that can take smarter scheduling decisions using **Machine Learning** techniques
  - Collaborations with the Microsoft Dhalion project team and Apache (incubating) Heron project team
- *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

## AWARDS AND RECOGNITIONS

- **Best student paper** at IEEE BigData Congress 2017, Honolulu, Hawaii
- 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

- **Introduction to Apache Quickstep and its scheduler**, various venues
  - SRI Labs, Menlo Park, California
  - Hortonworks, Santa Clara, California
  - Meetup organized by H2O.ai in Mountain View, California
  - SCI Labs, Computer Sciences, UW-Madison
- **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.

## ACADEMIC PROJECTS

- **Complex Event Processing**
  - Analyzed the scalability of and developed SQL like queries for Storm from Twitter
  - Evaluated the throughput and memory footprint of the execution
- **Indexing and Regular Expression Search for Text Documents in *Quickstep***
  - Facilitated bulk loading of text documents and construction of an inverted index
  - Implemented keyword and regular expression search for the documents
- **Database System Implementation using XML**
  - Analyzed the merits of XML in representing data in an object-relational model and using 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

<b>Programming languages</b>	C++, Python, Shell scripting, Java, C
<b>Data management</b>	MySQL, MonetDB, HBase, LevelDB
<b>Development environments</b>	Vim, CLion, Jupyter
<b>Web technologies</b>	JSP, JavaScript, CSS/HTML, PHP, ASP.NET, Django
<b>Publishing</b>	L <sup>A</sup> T <sub>E</sub> X, Microsoft Word, Open Office

## 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)