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Objective:

Seeking a challenging position in system design and development.

Areas of Expertise:

Database Systems (On Line Analytical Processing, Data Mining, Cube Computation, Query Caching), Networks, Web communities, Distributed Storage Systems.

Education:

Period	School	Degree	GPA
Aug 1996-Feb 2000	University of Wisconsin, Madison	PhD (Jan '00)	4.0/4.0
Aug 1994-May 1996	University of Wisconsin, Madison	MS (May '96)	4.0/4.0
July 1990-May 1994	I.I.T., Bombay, India	B. Tech.	9.38/10

Skills:

Languages: C++, Visual C++, C, Java, XML, Pascal, Lisp, Prolog, Fortran, Perl, Tcl

Operating Systems: Linux, VxWorks, SUN-OS, HPUX, NT

Software: Sybase, MS-SQL Server, NCR Teradata

Knowledge: Sockets, TCP/IP, ODBC

Thesis:

- **PhD Research : “OLAP - On Line Analytical Processing”**

The focus of my research is on designing and implementing extensions for database systems so that they can efficiently handle OLAP queries. This includes efficiently computing multiple related aggregates and estimating sizes of group-bys. Also studied ways of efficiently caching and reusing query results for OLAP.

- **Undergraduate Major Thesis : “Enumeration of Combinatorial Objects”.**

Involved developing algorithms for enumeration of objects like binary trees and polygon triangulations without repetitions using simple transformation operators.

Experience:

- *April 2002 - Current:* Senior Software Engineer at “Kuokoa Networks, Inc”, Sunnyvale. Designed and developed critical components of a distributed, scalable file system. Team lead for two other people.
- *Nov 2000 - March 2002 :* Senior Software Engineer at “Desana Systems”, Milpitas. Design and development of high performance applications for an application level monitoring and control switch.
- *Dec 1999 - Oct 2000 :* Senior Software Engineer at “QUIQ Corp.”, Madison. Design and development of a notification engine, developing infrastructure for building web based communities.
- *Jul 1998 - Nov 1999 :* Consulting Engineer at “NCR Corp.”, Madison. Design and development of an OLAP engine.

- *Summer 1997, Summer 1996*: Summer internship at “NCR Corp.”, San Diego. Preliminary design and development of an OLAP engine.
- *Fall 1994, Spring 1995*: Teaching Assistant for “Using Computers” at University of Wisconsin, Madison.
- *Summer 1993*: Trainee at “Godrej and Boyce Co.”, India.

Important Projects:

- **Journalling and Recovery.** Designed and implemented the recovery component for a distributed, scalable file system. Had to solve lot of unique problems arising due to virtualization and distribution. Developed a proprietary scheme adapted to the system hardware that could be delivered in a limited time frame.
Environment : x86, MIPS / VxWorks, Tornado / C, C++
- **Distributed Cache Manager and Distributed Object Store** Designed and guided the implementation of a distributed cache manager and object store. The cache manager has a transactional API and is closely integrated with recovery. This enabled easy conversion of single node applications into distributed recoverable applications.
- **Customer Manager.** Developed a module which manages connections to a proxy switch. It decides whether to accept the connection, applies connection limits, sets up the flow by coordinating with other modules and does connection teardown when the flow is terminated. It maintains persistence information used for server load balancing and also maintains information to identify user based on L7 content.
Environment : x86, PowerPC / Linux / C++
- **SLA Manager.** Developed a module which manages the service level agreements (SLAs) for an application level switch. The SLAs are based on the customer, application and the content of the L7 traffic. The SLA manager processes these SLAs and programs them into hardware tables, which enforces the SLAs.
Environment : x86, PowerPC / Linux / C++
- **Notification Engine.** Implemented a notification server, which keeps track of queries saved by users of a web community. The system continuously evaluates the queries and notifies the user whenever there is some new data satisfying the query.
Environment : x86 / Linux / C++
- **Web Community Projects.** Developed the specification of client web communities using XML and developing the required enhancements in the web community software infrastructure.
Environment : x86 / Linux / XML, Java
- **OLAP Engine.** Implemented a prototype OLAP engine. It is a middleware that provides OLAP functionality on top of any database engine at the backend. It provides a mechanism for caching query results and metadata for improved query performance.
Environment : Sun SPARC, x86 / Unix / C++
- **Implementation of CUBE operator.** In this project we designed and implemented an efficient algorithm for computing the CUBE, which is a new relational operator proposed by Gray et al. This was done as part of the Research fellowship in Summer '95.
Environment : Sun SPARC10 / Sun-OS / C++
- **Implementation of Linear Hashing in the SHORE Database system.** SHORE is heterogeneous object store database developed at the University of Wisconsin Madison. We added Linear Hashing as an index structure into SHORE with full Concurrency Control and Recovery.
Environment : Sun SPARC10 / Sun-OS / C,C++ / SHORE tools

- **Implementation of B+ tree structure for Database Management.** An interface to a Page-File (PF) layer was given. We implemented a B+ Tree layer over it for storage and retrieval.
Environment : DRS6000 / Unix / C
- **RPC Package for Java.** We added RPC support to Java. Functions were provided so that both RPC clients and servers can be programmed in Java. The underlying Sun RPC was used to implement the RPC package. *Environment* : Sun SPARC10 / Solaris / Java, C
- **Implementation of an ATM layer and a reliable file-transfer application.** Implemented an ATM layer on top of the UDP layer and built a file transfer application on top of it. The application supported concurrent file transfers.
Environment : Sun SPARC10 / Sun-OS / C / Sockets

Publications:

- *“Caching for Multi-Dimensional Data Mining Queries”*
With Biswadeep Nag and David DeWitt. SCI 2001.
- *“Aggregate Aware Caching for Multi-Dimensional Queries”*
With Jeffrey Naughton. EDBT 2000.
- *“Materialized View Selection for Multi-Cube Data Models”*
With Amit Shukla and Jeffrey Naughton. EDBT 2000.
- *“Using a Knowledge Cache for Interactive Discovery of Association Rules”*
With Bishwadeep Nag and David Dewitt. KDD 1999.
- *“Materialized View Selection for Multidimensional Datasets”*
With Amit Shukla and Jeffrey Naughton. VLDB 1998.
- *“Caching Multidimensional Queries using Chunks”*
With K. Ramasamy, A. Shukla and J. Naughton. SIGMOD 1998.
- *“Simultaneous Optimization and Evaluation of Multiple Dimensional Queries”*
With Y. Zhao, J. Naughton and A. Shukla. SIGMOD 1998.
- *“An Array-Based Algorithm for Simultaneous Multidimensional Aggregates”*
With Y. Zhao and J. Naughton. SIGMOD 1997.
- *“Cubing Algorithms, Storage Estimation, and Storage and Processing Alternatives for OLAP”*
With J. Naughton, K. Ramasamy, A. Shukla, K. Tufte and Y. Zhao. Data Engineering Bulletin 20(1): 3-11 1997.
- *“On the Computation of Multidimensional Aggregates”*
With S. Agarwal, R. Agrawal, J. Naughton, S. Sarawagi and R. Ramakrishnan. VLDB 1996.
- *“Storage Estimation for Multidimensional Aggregates in the Presence of Hierarchies”*
With A. Shukla, J. Naughton and K. Ramasamy. VLDB 1996.

Honors:

- Recipient of the National Talent Search Scholarship. Every year 1500 students are selected from throughout India.
- All India Rank of 14 at the I.I.T., Joint Entrance Examination, 1990, out of nearly 100,000 candidates.
- 3rd in the State Divisional Board at the Higher Secondary School Certificate Examination, India, 1990.

References:

Available on request.