

# Kushal Tayal

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## OBJECTIVE:

Seeking a **summer internship** (*June - Sept' 2011*). My core areas of interests are **algorithms** and data-structures.

## PROFESSIONAL SYNOPSIS:

Ranked 13/34 in the Indian National Mathematics Olympiad.

Currently working as a Research Assistant on the Sequoia project under Prof. Alex Aiken.

## EDUCATION:

### Stanford University

Master of Science, Computer Science (Theoretical Computer Science + AI) (**GPA - 3.85 / 4**) (*Expected June'12*)

### College of Engineering, Pune, India

Bachelor of Technology, Information Technology (**GPA: 8.67 / 10**) (*June'10*)

## WORK EXPERIENCE:

### Cache Aware Data Structures and Algorithms

(*Feb'10 - July'10*)

(*B.Tech. Thesis at Computational Research Laboratories Ltd.(CRL), Pune, India*)

Development of a new cache-aware data structure to make use of cache behavior. The data structure shows a 2x improvement compared to traditional binary tree. New algorithm for development of Cache Optimal Binary Search Trees (trees having least expected search time considering the cost of cache access) based on the cache aware data structure. An improvement of close to 48% compared to traditional Optimal Binary Search Tree is observed.

**Tools used:** C++ on linux platform, Intel vTune for profiling, Latex and XFig for documentation.

### E-Broker portal (*Software Engineer, Amura Technologies, Pune, India*)

(*Dec'08 - Feb'09*)

C#.Net web service under Service Oriented Architecture and Multi-tier Architecture.

Server and Client side caching with help of database triggers. Indexing, Threading and Logging enabled.

**Tools used:** Visual Studio 2005(C#.Net), Microsoft SQL Server 2005, Adobe Flex, Adobe Dreamweaver.

## PROJECTS:

### JIT compilation of common Kernels in Sequoia using Supervised Learning (*Machine Learning Course Project*)

Used machine learning techniques to model common kernels in Sequoia (a portable, locally-aware parallel programming language) and learn the tunable variables used by it to generate code optimized for the target architecture. Successful in building models for most of the targeted kernels. Currently working on improvements and possible new techniques.

**Tools used:** Matlab

### Intrusion Detection System using K-Means Algorithm (*Class project – Junior year*)

Live packets from network or XML document containing packet data serves as input. The packet properties like size, inter-frame delay, source IP/port, etc are be used as the dimensions of data points. Sample data containing known intrusion packets are clustered using K-means to set benchmarks. The live packets are clustered and compared with the benchmarks to determine probable intrusion packets.

**Tools used:** Visual Studio 2005 (C#), Open source library for packet capturing.

## PROGRAMMING SKILLS:

Operating Systems: XP/Seven, Linux, Mac OS X (learning)

Programming Languages: C, C++, Java, Visual Basic, C#

Database Management Systems: MS Access, Oracle 9i, Microsoft SQL Server 2005

IDE and Tools: Matlab, Eclipse, Net Beans, Visual Studio, vTune, Latex, Xfig

## HONORS AND AWARDS:

Ranked **13/34** in Indian National Mathematics Olympiad and qualified for the International Mathematics Olympiad training camp at Bhaba Atomic Research Centre, Mumbai.

Successfully passed the Regional Mathematics Olympiad.

Ranked **5th** in the Junior Mathematics Olympiad conducted by Bhaskaracharya Pratisthan, Pune.

Selected in the '**Catch Them Young**' program, organized by Infosys - 2 week VB training program in Infosys, Pune campus while in grade 10.

Ranked **4th** in district in the Maharashtra Talent Search (MTS) examination while in grade 8.

Ranked **162nd** which resulted in distinctive performance in National Science Olympiad (2002) while in grade 8.

## EXTRA-CURRICULAR:

Organizer, Mindspark 2008, 2009: An annual event at COEP.

Won 2nd prize in AI Wars competition at Mindspark 2009, a national level event.

Active member of Rotaract Club Pune, indulging in social service activities (blood donation, polio vaccination, etc.)

Hobbies - Sports (Soccer, Badminton, Basketball), Computer Gaming, Computer and Technology reading.