Jai Kumar Singh
junior Postgraduate
Department of Computer Science & Engineering
Indian Institute Of Technology, Kanpur

Objective

To obtain a challenging Internship project during the period of May'08 to july'08. So that I can enhance my knowledge and practical skills to pursue my research interests.

Academic & Research Interests

Computer & Wireless Networks
Algorithms & Data Structure
Data Streaming, Clustering and Indexing

Academic Background

B.Tech-M.tech Dual Degree
Major - Computer Science & Engneering
Institute - Indian Institute Of Technology Kanpur
CGPA - 3.1/4.0 or 7.7/10.0 (Undergraduate)
Masters' Thesis - Clustering and Indexing in Biometrics
I am working on clustering and indexing for biomertic data. My supervisor is Prof. Phalguni Gupta, CSE, IIT Kanpur.
Year - 2009 (As expected)

Intermidiate Examination & High School Examination
Board - Uttar Pradesh Board Of Intermidiate & High School Examination
College - Nanak Chand Anglo Sanskrit Inter College, Meerut
Aggregate - 82%(with 94% In Physics,Math,Chemistry) In XII^{th}
Year - 2003

Work Experience

Summer Internship

Helsinki Institute for Information Technology, Summer of 2007
Under guidence of Prof. Andrei Gurtov, HIIT
I work on InfraHip project. There, I learned many things including iptables, libpcap, iproute2 and have hand on experience with gdb, ddd, tcpdump, wireshark. I also learned how to sniff and inject packets in network, How to play with kernel codes, IP security issuses in kernel TCP/IP stack. I solved bug id 98 – global HIT prefix, 327–kernel 2.6.19.7 and hipd routing problems, 330–kernel 2.6.19.7 and hipd, successfully. And I have also done some work for bug id 101–LSI support and 172–privilege separtaion. Overall a very good new experience and exposure.
Reference::http:\\infrahip.hiit.fi

Thesis & Current Projects

Masters' Thesis:Indexing & Clustering for Biometric data
Under guidence of Prof. Phalguni Gupta, Dept. Of Computer Sci. & Engineering, IIT Kanpur
I am working on clustering and indexing methods in Biometrics. First I will analysis various clustering and indexing methods in Biometrics and there pros and cons on various aspect for biometric data. Then I will propose a clustering and indexing algorithm to optimize over biometric data. This project is my masters' thesis work and currently ongoing.

Dual Data Structures:Priority Queues & Binary Search Tree, Spring of 2008
Prof. R. K. Ghosh, Dept. Of Computer Sci. & Engineering, IIT Kanpur
Linearizability is a correctness condition which is used to verify the correctness of concurrent programs. Non-blocking dual data structures like dual stack and dual queues exist which use the concept of linearizability to allow lock free access to concurrent threads. We Study and discuss the requirements for data structures to be lock free. Then, We'll implement non-blocking and lock-free structures for priority queues and binary search trees and compare the performance of these non-blocking structures with their counter-part lock based and blocking alternatives.

Clustering and Indexing in Bioinformatics: A Survey, Spring of 2008
Prof. Somnath Biswas, Dept. Of Computer Sci. & Engineering, IIT Kanpur
We will survey over clustering and indexing methods of DNA microarrays in Bioinformatics. We'll study and analysis K-means, Hierarchical, Block and Eigen Cluster. We will try to find out pros and cons of theses clustering algorithm over DNA microarrays and try to optimize theses algorithms for DNA microarrays.

Past Projects

Prefetching & Caching protocols for Wide Area Wireless data dissemination, Fall Of 2007
Prof. R. K. Ghosh, Dept. Of Computer Sci. & Engineering, IIT Kanpur
Idea is to potentially predict what user might need in near future and prefetch and cache the data. Problem in this approach is in prediction of future data access and it can be severe if the Mobile user is going from one hot-spot to another. Because this is time when user actually be using low bandwidth network that can result in really high latency. So, correct prediction of future data access is highly neccessary. In our approach, we use user's speed, location, route, history to predict future data access.

Simulation Of distributed Top-k Monitoring, Fall Of 2007
Prof. Sumit Ganguly, Dept. Of Computer Sci. & Engineering, IIT Kanpur
Querying and analysis of data streams over distributed networks to find Top-K set is a topic which has gained lot of importance in recent times because of its application in field of networking, web usage analysis and other. One possible solution is to send all the streams to a centralized server and then find the the Top-K set but it will incur lot of overhead and load at the server. Therefore, some algorithms have been proposed to directly monitor the Top-K set over distributed data streams. These algorithms eliminate the need to transmit entire data streams and ensure that the top-k set is valid at all times within given error tolerance. We simulate this Top-K set algorithm in java.

A Dynamic Hop-2-Hop Routing protocol for Wireless Sensor Networks, Spring Of 2007
Prof. Bhaskaran Raman, Dept. Of Computer Sci. & Engineering, IIT Kanpur
In Wireless Sensor Networks (WSNs) elaboraive protocols often aim for unnecessary optimization, overkilling the applications and making implementations dicult. We design a simple dynamic routing protocol based on the hop-count metric, with an emphasis on quick convergence and robustness.

Network Performance Mesurement Tool, Fall of 2006
Prof. Bhaskaran Raman, Dept. Of Computer Sci. & Engineering, IIT Kanpur
This measurement tool gives information about network quality between any two hosts based on packet loss rate, TCP throughput & UDP throughput, which is calculated by sending UDP, TCP packets from one hosts

to another. Except that, any third host can also request the other two host to give the report of network measurement between them. Codes are being written in C & BSD socket Programming.

Offline Browser, Summer Of 2006
Prof. R. K. Ghosh, Dept. Of Computer Sci. & Engineering, IIT Kanpur
Idea is to locally cache webpages for further usage and update them after a regular interval through a centarilised local server. This is really helpful for localities where network is of very low bandwidth. So whenever some client have to update his cache or want a new webpage, he can send his query to the Centralised server. If the Server already has the query in his cache then it forwards the same to the client otherwise it uses the internet and after caching the page, forwards it to the client. Codes are being written in Java & Bash Scripts.

BeaKoN, Spring Of 2007
Prof. Amit Ray, Dept. Of Huminty & Social Science, IIT Kanpur
We make an alarm management system that integrates all alarms at home, office, storage or factories and sends message [SMS] and/or e-mail to concerned person in event of any alarm getting tripped, with details of which alarm tripped and when, through internet using a Computer.

Criminal Records, Spring Of 2007
Prof. Sumit Ganguly, Dept. Of Computer Sci. & Engineering, IIT Kanpur
We designed and implemented a criminal database records system. This is done as a course project in Database Management System course.

Compiler of Modula2, Spring Of 2007
Prof. Sanjeev K. Agarwal, Dept. Of Computer Sci. & Engineering, IIT Kanpur
We designed and implemented symbol table, lexical, syntactical & run time system for Modula2. We implemented this compiler in java.

BRiCS, Winter Of 2005
Prof. Amitabha Mukerjee, Dept. Of Computer Sci. & Engineering, IIT Kanpur
This is a GUI based interface for lego programming(LEGO kit) written in Java using Eclipse Platform. Main aim of the project was to provide an Interactive interface for LEGO programmer to program their lego-machine based on Add-Drop nodes and making flowchart. Flowchart Corresponding java Program & machine level code produced by the Interface and flowchart is saved in Tree-node structure.

Computer Skills

Operating Sytems	Linux, Windows VISTA/XP, TinyOS
Programming Languages	C/C++, Java, MySQL, HDL Verilog, BSD sockets
Scripting Languages	JavaScript, Bash, Lex, Yacc, PHP, Perl
Tools & Others	Netbeans, Vim, Kdevlop, Eclipse, MS Office, LaTeX, Html, Xml, Make

Awards & Achievements

Secured Rank 23 in XII^{th} Merit of UP Board Of Intermidiate & High School Exam' 03.
Awarded by District Magistrate of Meerut for Excellent Academic Performance in year 2003
Secured AIR 62(SR 2) in All India Engineering Entrance Examination' 04 out of more than 2,00,000 students.
Secured Rank 4 In State Level Engineering Entrance Examination'04 Out of more than 1,00,000 Students.
Secured AIR 80 In IIT JEE'04 Screening out of 1,70,000 students.
Secured AIR 91 In Combined Entrance Examination' 04 conducted by Delhi College Of Engineering.
Got B Certificate In NCC (National Cadet Corps).
Certified In NSS (National Service Scheme) for 12 days camp in year 2003.

Note: SR = State Rank In Uttar Pradesh, AIR = All India Rank

Ongoing/Done relevant Courses

Modern Cryptology*	Topics in Bio-Informatics*
Randomized Algorithms*	Distributed Systems*
Mobile Computing	Algorithms in Data Streaming
Principles Of Programming Languages	Software Engineering
Wireless Networks	Computer Networks
Principles Of DataBase Systems	Operating Systems
Compiler Design	Advance Algorithms
Programming Tools & Techniques	Theory of Computation
Data Structures & Algorithms	Introduction To Computer Organisation
Fundametals Of Computing(Java Programming)	Computational Methods In Engineering
Introduction To Electronics	Introduction To Electrical Engineering

Note: '*'marked courses would be completed in April'08.

Other Courses

Introduction To Profession	Mechanics of Solids
Classical Mechanics	Relativistic Mechanics
Introduction to Manufacturing Process	Differential Equation
Linear Algebra and Complex Analysis	Multivariable Calculus
Electromagnetism and Modern Physics	Engineering Graphics
Introduction of Mordern Art	Art & Product Design

Personal Information

Date Of Birth	1 August, 1985
Sex	Male
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References

References would be produced on request.