Ashutosh Pathak

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Education

Degree/Certificate	Institute/School,City	CGPA/%
PG cpi	Indian Institute of Technology, Kanpur	7.2/10.0
UG cpi	Indian Institute of Technology, Kanpur	6.1/10.0
AISSCE-XII,CBSE	Senior Secondary School Sector -X ,Bhilai	73%
AISSE-X,CBSE , school topper	Kendriya Vidyalaya Sarni,MP	83.6%

Awards

- Secured All India Rank **416 in IIT-JEE** exam in 2004 in general category.
- Secured All India Rank 1200 in the AIEEE 2004 with state rank 12.
- Cleared the first phase and secured the **Top 1% in National Physics Olympiad** .
- Secured All India Rank 2 in the ICFAI engineering exam 2004 .

Research & Technical Capability

- **International Exposure & Research Paper :-**
  INSTITUTE NATIONAL DES TELECOMMUNICATIONS (INT),Paris, France .
  During **summer internship (may - July 2007)**, my duty was to work on robust Watermarking Techniques on videos & Study the different kind of attacks to compromise the watermarking .Work involved Signal theory ,DCT and Wavelet Transform, X.264 codecs, and fast processing of video frames .**Achievement:-** I have suggested a block wise DCT transformation which result in slight speedup. .
- **Thesis:-** "Biometric Online signature verification using Digital Signature Pad ". Supervisor :- Dr Phalguni Gupta . This is part of a MHRD sponsored project MULTIMODAL BIOMETRICS and is currently on going at IITK.
- **Work Experience :-** During summer vacation of 2^{nd} year,I got the opportunity to work at **SIMORTEL company**. My duty was to work on a GPS based software to track the buses in city which is more likely to be used in near future in India. 2000 lines of Code was written in C.Project involved sql quarries , Dictionary data structures , network sockets and Multi threading .

Positions of Responsibility

- **Teaching Assistant(TA),Computer Organization course ,Aug 2008-ongoing)**
  Responsibilities included advising weak students, designing assignments and helping the course students in implementation of ALU , Regfile, Ram , CPU in Spartan series 3 FPGA Board in Hardware lab using xilinix IDE and verilog language.
- **Mentorship:-**I Mentored the winter project under the **Sun Club** and lead the group of 3 people and helped them in completing the project.Project involved the development of online room booking system using JSP and Tomcat with the help of netbeans IDE.

Courses

Relevant:

- System related:-
  Distributed Systems , Operating Systems, Computer Organization ,Fundamental of electronics, Principles Of Database Systems , Compiler Design , Indexing & searching in Databases.
- Theoretical:-
  Advance Algorithms ,Data Structures ,Parallel and semi Numerical Algorithm ,
  Theory of Computation ,Numerical Methods In Engineering, Linear Algebra, Discreet Mathematics .
- Network related:-
  Mobile Computing ,Computer Networks ,Data Streaming .
- Software :-
  Principles Of Programming Languages ,Software Engineering ,Internet technologies ,
  Programming Tools &Techniques, Fundamentals Of Computing(JAVA) .

other courses: rest are from grade sheet.

Major Projects

- **Similarity Search in Time Series Database**
  - Aim was to implement the technique for fast retrieval and search similar time series in large video & audio database . Dynamic Time Warping(DTW) method is studied for searching KNN(K^{th} nearest neighbor) quarries .
- **Offline Biometric Signature Verification**
  - Developed a signature verification system using SVM(Support Vector Machines) which can be used for scanned images of signature of person.Maximum Accuracy achieved was 80% in skilled forgery and 83% in random forgery . code was written in matlab .
- **User level Thread Library with mutual exclusion support**
  - Implemented user level thread library taking care of issues like scheduling, starvation and fairness using Linux system calls provided in ucontext.h, signal.h, sched.h, & setjmp.h like makecontext , swapcontext etc. Studied various distributed mutual exclusion algorithms (non-token and token based) and measured throughput and synchronization delays for them .
- **Concurrent Vi**
  - Aim was to make **Vi** a concurrent editor of Linux able to edit same file by more than one process.we implemented user defined locks in the data section for concurrency.Code was submitted on sourceforg.net and get much appreciation from open source community as it was totally new feature in the Vi .Project involved going into the vim source code of more that 6000 lines.
- **Parallel Solver for Very Large System of Equations**
  - Successfully developed a solver for a large system of equations of order 50000x50000 using MPI and openMP .It is for clusters and mesh connected computers, with inputs in , GF2 and real field .
- **Oberon Compiler**
  - Developed a bare minimal compiler for Oberon language in java with almost all features having lexical ,Syntax Analyzer and Semantic analyzer phase .It can compile programs involving recursion and simple case statements.4000 lines of code java
- **Dual Stapler**
  - As a part of ART course project we made a single stapler able to use two kind of pins . we designed a innovative multipurpose stapler, we secured **A grade** in this.
- **Medical Records**
  - Developed a web server and database driven management system using LAMP architecture.It can show statistics of population, diseases, region and year . Work involved Apache and mysql database .
- **Extension of Nachos**
  - Implemented some features like System Calls, Scheduling Algorithms, Multiprogramming and Virtual Memory on Nachos operating system in C++.
- **UDP-Chat System**
  - We Developed a chat system with functionalities of conferencing and file sending .We have implemented reliability, flow control and congestion control over transport layer in User Datagram Protocol (UDP) using socket programming.we also checked the performance of our chatting protocol using The **Network Simulator - ns2**.
- **Implementation of Mips Processor**
  - Implementation of MIPS processor having Instruction-fetch & Register-decode unit,ALU, Register file and MEM unit using SRam and Block Ram .Work was done on Spartan-3(FPGA board)in Verilog with help of Xilinix IDE.
- **Motion Detector**
  - Implemented a motion detection algorithm for video using background subtraction which can detect moving objects in the video in still camera position.1500 lines of code in C#.Net

Skills

Languages: C/C++, LaTeX, Java,C#,Php,ruby,bash shell scripting,UML, Verilog, IA32 Linux Assembly ,xml, Sql.

Operating Systems: Linux (Redhat , Ubuntu ,Fedora), Solaris, Windows 95/98/NT/2000/XP

Applications and IDE: Mathematica, MatLab,Visual Studio,Eclipse, Netbeans,GCC debugger, OpenOffice, MS Office XP ,Ruby on Rails, LAMP, Apache Web Server, Mysql, Oracle, Lex , Yacc,Doxygen, Gnuplot.

Lab Skills and Experience: FPGA Board , Mechanical Lab , Electronics Lab.

Miscellaneous: Able to apply software engineering concepts,have strong verbal and written communication skills, excellent troubleshooting and debugging skills, exceptional problem solving skills & good team spirit.

Interests And Extra Curricular

Academic: systems, os, network, databases , new web based technologies , micro controllers ,Finance .

Sports: football ,swimming.**I was in Institute swimming team during 1st year at IITK**.

Computers: Mozilla beta tester, enjoy using and learning Linux systems .

technology: reading latest technology news using Zdnet ,Code project.

Other: Reading novels,Stocks Rate , mountain tracking .