Vedant Mishra

CONTACT INFORMATION

Software Engineer,
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RESEARCH INTERESTS

Computer Networks, Mobile Computing, Computer System Architecture

EDUCATION

Indian Institute of Technology Kanpur

BTech. in Computer Science and Engineering **(2010 – 2014)**

- Cumulative Performance Index (CPI) of **8.8** (on a scale of 10)

All India Senior School Certificate Examination, CBSE India **(2010)**

- Scored cumulative **82.0%** marks in Senior Secondary School.

All India Secondary School Examination, CBSE India **(2008)**

- Scored cumulative **91.4%** marks in High School.

PUBLICATIONS

V. Mishra, R.K. Ghosh, V. Kataria, "Indoor Navigation System Using Optical Mouse Sensor and Smartphone", accepted at *Proceedings of Fifth International Conference on Indoor Positioning and Indoor Navigation (IPIN), Busan, Korea*, October 2014 and **IEEE** Xplore Digital Library [paper]

AWARDS AND ACHIEVEMENTS

- Received **IIT Kanpur Academic Excellence Award** (awarded to top 5% students) in 2011-12.
- Ranked among **Top 5%** in the institute (out of 820 students)
- Recipient of Merit Cum Means **Scholarship** for all 4 years of IIT for **excellent performance** in academics.
- Ranked in **Top 0.05%** (amongst 0.5 million students) in IIT-JEE 2010.
- Placed in **Top 0.05%** (amongst over 1 million students) in AIEEE 2010.
- Secured **1st Rank in International Mathematics Olympiad** organized by SOF in year 2008.
- Awarded **Certificate of Merit** for being in top 1% **National Physics** Olympiad in 2010

WORK EXPERIENCE

Arista Networks India Pvt Limited, Bangalore (July 2014 - present)

" Bidirectional Forwarding Protocol Detection (BFD) over IS-IS protocol"

- Designed, implemented and tested BFD protocol end to end on Line card as an individual contributor. Implemented BFD state machines (three-way handshake) to handle various states
- Handled security and spoofing issues with BFD by using cryptographic authentication algorithm
- Reduced detection time to <1 sec(400% improvement). This feature allowed Arista to sell switches to Facebook, Microsoft and other networking firms.

"Optimization of show ip route x.x.x.x command "

- Handled scalability issues with CLI output when more than 64000 IPv4 or IPv6 routes are programmed on a switch
- Analysed python profiling data, and determined the CPU intensive tasks that could be optimized. Reduced the time taken from 89sec to 16sec thus improving the efficiency by 550%

RESEARCH EXPERIENCE

"Low cost Indoor Navigation System for Visually Impaired"

Mentored by Dr R.K. Ghosh (Jan 2014 - July 2014)

- Developed indoor navigation system comprising of an optical sensor based wireless navigation system kit for displacement detection and an Android smartphone for position computation
- Provided support for path finding using A-star path finding algorithm. Achieved high accuracy of 98% with the prototype costing less than 40USD
- Sanctioned a grant of upto 0.5 million INR under the GOOGLE IIT Pilot Program

"B-Tech Project : Android Application for Hindi Gesture Based Writing"
Advised by Prof. Arnab Bhattacharya, IIT Kanpur (Jan 2014 - April 2014)

- Built an Android application which processes users drawing gestures and predicts possible Hindi characters based on them.Character set implemented: constants, vowels, matras and numerals.
- Application trains itself according to user. Threshold score for each character is calculated based on a heuristic algorithm.

"Hindi and Bangla OCR System for Crowd Sourcing"
Research Project under Prof Arnab Bhattacharya, IIT Kanpur (Aug 2013 - Nov 2013)

- Implemented a crowd sourcing system that would take an image and perform OCR on it.
- Analyzed and summarized the existing Optical Character System (OCR) systems for Hindi and Bangla Language for their efficiency and robustness.
- Analyzed performance for Tesseract (Google OCR system) based on correctness of word.

Key Academic Projects

"Compiler for a subset of C++ to MIPS Assembly"
Mentored by Prof. Sanjeev K Aggarwal (Jan 2013 - May 2013)

- Designed a compiler for a subset of C++ programming language which can generate code for SPIM architecture with the following features support: Data types, Operators, Statements, Functions (with return type and recursion).
- Lexical, syntax, semantic analysis followed by intermediate and final code generation.

"Taxi Pooling Android Application"
Course Project for CS455 (Software Engineering) under Dr T.V. Prabhakar (Aug 2013 - Nov 2013)

- Developed an android application which allows users to find their partners for sharing their trips with other people. The application has various features including searching existing trips, creating a new trip and getting notified whenever another user requests to join a trip.
- Designed an efficient database optimizing it such that queries and data retrieval take minimum amount of time. Used PostgreSQL, PHP and Javascript

"Augmenting PintOS operating system"
Course Project for CS330 (Operating System) under Dr. Subhajit Roy (Aug 2012 - Nov 2012)

- The project aimed at providing various functionalities to PINTOS, instructional software that runs as secondary OS on Linux
- Implemented POSIX message queues, threads, processes, multiprogramming, scheduling policies, virtual and shared memory management and file-system
- Complied with POSIX standards; Implemented and studied various scheduling policies viz. FCFS, SJF, RR; Used C

"Implement an Email Client"
Course Project for CS425 (Computer Networks) under Dr. Dheeraj Sanghi (Aug 2012 - Nov 2012)

- Developed a desktop email client in python which allows user to configure multiple email accounts(like Gmail, Yahoo)
- Allows user to send mails in pending mode when no internet connectivity available (offline mode). Supports IMAP for retrieving mails and POP3 and SMTP for sending mails

"Implementation of SDLX Processor on FPGA Unit"
Course Project for CS220 (Computer System and Organization) under Amey Karkare Aug 2011-Nov 2011

- Designed a Digital clock module which gives time as the output and could also perform some utility functions including alarm clock and stopwatch. Coding was done in BlueSpec Verilog
- Designed a simple processor by implementing an ALU which takes two 4 bit inputs and a 3 bit opcode to select the operation to be performed and output a 4bit number on a 7 segment display of FPGA using Register files

Summer Internship

Arista Networks India Pvt Limited, Bangalore (May 2013 - July 2013)

"Command line interface (CLI) to display unprogrammed routes in kernel"

- Designed a model for storing the routes programmed in the userspace but not in the kernel
- Developed a CLI command for displaying all the unprogrammed routes along with their errors
- Debugged live customer issues and network problems in case where packets are not sent as expected. The development is in C, C++ and Python with focus on scale

"Feature Development on top of routing protocol IS-IS"

- Worked on linux based Arista's own OS called Extensible Operating System or EOS that was used in companies' switches. Created various automated python scripts to test the integrity of the code so as to cover all the permutations
- Displayed a warning when IS-IS is enabled on an interface with no ip address configured

Travelyaari - Online Bus Booking Website , Bangalore (May 2012 - July 2012)

"Project aimed at Analysing, Parsing of travel logs and Data visualization in the form of graph "

- Created a C#/MySQL tool to analyse and process server logs(1GB/day)
- Visualized data as charts and graphs based on the aggregated data from the log analysis using tools like PHP,CSS. Enhanced Database Performance by writing stored procedures and sent out scheduled email reports
- Developed a system to monitor and send bookings and transaction reports over email

Relevant Courses

Systems and Networks: Computer Networks, Mobile Computing , Compiler Design , Operating Systems, Computer System and Organization

Algorithms: Data Structures and Algorithms, Advanced Algorithms, Algorithms II

Computer Science: Database Management Systems, Artificial Intelligence, Theory of Computation, Software Engineering, Principles of Programming Languages, Programming Tool

Mathematics Courses: Probability and Statistics, Discrete Mathematics, Mathematical Logic, Statistical Simulation and Data Analysis

Technical Skills

Programming Languages - C, C++, Java, Python, HTML, PHP, Java Script, Oz, Smalltalk, Assembly Language ,Bluespec Verilog

Other Tools - LaTeX, Beamer, Yacc, Make, Shell, awk, GNU Octave, SQL, GDB, MATLAB, Autocad

Extra–Curricular Activities/ Position Of Responsibilty

Coordinator, IDEAS, Business Plan Competition in Techkriti, Annual Technical Festival in year 2013 - Led a team of 12 people to efficiently handle 30% increased participation, making it flagship event. Arranged one to one mentoring for many of the finalists, with supporting Angel Investment Firms and eminent people on Judging Panel

Secretary, Dramatics cell - in Antaragni, Annual Cultural festival, 2011- 2012

Awarded Judges Choice Award - Developed a social app for local shopkeepers in Yahoo HACKU12, a 24 hour hacking event, using YQL and PHP

National Cadet Corps - Completed one year training program of National Cadet Corps (NCC) in IIT Kanpur , 2010 - 2011.