Harshit Maheshwari

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EDUCATION

Year	Degree	Institute	Grade
2015	M.Tech./B.Tech.	Computer Science and Engineering, IIT-Kanpur	9.5/8.5
2010	Class XII CBSE	D.A.V. Kota	89.6%
2008	Class X CBSE	NavRachna School, Baroda	92%

ACADEMIC ACHIEVEMENTS

- Secured All India Rank **192** in IIT-JEE 2010 among 480,000 candidates *(2010)*
- Awarded Merit Certificate in Mathematics by CBSE for being among top **0.1%** students in AISSE *(2008)*

QUALCOMM, FEMTOCELL TESTING TEAM (INTERN)

- Developed code for testing of Femtocell; simulated voice calls, data calls, FTP upload/download, Ping and SMS on femtocell (based on Random Partial Order Sampling Algorithm)
- Automated and implemented multiple parallel instances running on the femtocell and ported the code to ATOMS

INTERESTS

Machine Learning, Database Systems, Computer Vision, Software Engineering

MASTERS THESIS

- **Boltzmann Sampling Techniques** *(Jan 2014 - Ongoing)*
  M.Tech. thesis, Advisor: Prof. Satyadev Nandakumar
  - Studied existing techniques for random generation of recursive structures
  - Designed an algorithm for generation of Grid Graphs on Regular Tilings using Boltzmann Samplers
  - Working towards using Boltzmann sampling techniques to generate random recursively enumerable structures for which no known efficient algorithms exists

RESEARCH PROJECTS

- **Low Cost Indoor Navigation System Using Optical Mouse Sensor and Smart Phone** *(Oct 2014 Ongoing)* **GOOGLE-IIT Pilot Program**
  - Developing a low cost indoor navigation system for visually-impaired people using smartphones and optical odometer; Wireless system expected to be highly accurate; Sanctioned a grant of up to **5 lakhs** under the program
- **Use of 'auto' keyword in Java Course** *(Jan - May 2014)*
  Project in CS698Y:Topics in object oriented language implementation, Advisor: Prof .Rajeev Kumar
  - Received **'best semester project mention'**; Proposed the use of auto keyword in Java to help developers focus on logic rather than syntax which compiler can deduce itself
  - Modified existing Java grammar rules; derived rules for type-inference and type-unification for return type of functions
- **Predicting Transcription Factor Binding Sites and Enhancers Position in Genomes** *(Jul - Dec 2013)*
  B.Tech Project (CS498), Advisor: Prof. Arnab Bhattacharya, Prof. Amitabha Bandopadhyay
  - Using a variant of P-match algorithm predicted transcription factor binding sites in a gene sequence
  - Used sliding window technique and developed trie based approach to filter the possible enhancers position in genomes
  - Tested the tool on a set of co-expressed genes and validated the results experimentally
- **Offline Alphanumeric Character Recognition** *(Jul - Dec 2013)*
  Course Project in CS771: Machine learning tools and techniques, Advisor: Prof .Harish Karnick
  - Developed a classifier to recognize alpha-numeric characters using weka (machine learning library) in Java
  - After feature extraction and dimensionality reduction: applied, tested and compared K-NN, SVM and random forest
- **Author Identification** *(May - Jul 2012)*
  Advisor: Prof. Ajai Jain
  - Studied writing styles of authors and designed an algorithm to classify a new text piece
  - Extracted different features such as era, genre, sentence depth, sentence length and punctuation marks of 200+ novels

– Achieved an accuracy of 85% in classification of test data comprising of 42 new novels

- **Question Answering System Based on PLSA (Probabilistic Latent Semantic Analysis)** *(Jan - April 2012)*
  Course Project in CS365: Artificial Intelligence, Advisor: Prof. Amitabha Mukerjee
  - Developed a program to answer queries posed by the user in Python with GUI designed using JavaFX
  - Applied PLSA on modified Term-Document Matrix created using Expectation Max. algorithm to rank results

KEY PROJECTS

- **LAMP-based Railway Ticket Reservation System** *(Jan - Apr 2013)*
  - Received **'best semester project mention'**; Implemented a Railway Ticket Reservation System like IRCTC with features that allowed train search, seat availability query, ticket booking & cancellation, account maintenance
  - Implemented waitlist clearance and Seat Allocation Algorithm to allow for maximum seat occupancy

- **Laboratory Data Management System** *(Jul - Dec 2013)*
  - Developed a software that allows Lab researchers to store Laboratory Observations in an organized manner
  - Used HTML5, CSS, JavaScript(AJAX), JQuery, BootStrap Library & WAMP for development of online application

- **Extension of PintOS operating System** *(Aug - Nov 2012)*
  - Implemented message queues, threads, processes, virtual & shared memory management & file-system
  - Complied with POSIX standards; Implemented and studied various scheduling policies viz. FCFS, SJF, RR; Used C

- **Compiler for Java to MIPS Assembly Language** *(Jan - Apr 2013)*
  - Provided for classes, objects, constructors, access modiers, inheritance, type coercion, polymorphism
  - Developed in four phases viz. lexical, syntactic, semantic & code generation; Used FLex, Yacc
  - Provided for basic data types and constructs, multidimensional arrays & functions (including recursive)

- **Web based File Hosting System** *(Oct - Nov 2012)*
  - Used LAMP to implement a web based file hosting system that simulates separate file system-like tree hierarchy
  - Implemented features like provision for user account, login, selective file hosting and downloading

- **Virtual Boxing** *(May - Jul 2011)*
  - Designed a program to detect hand motion of user using webcam and simulated them in a 3-D world in real time to implement a virtual boxing game against AI powered computer player
  - Used OpenCV, OpenBlobsLib libraries for hand detection and OpenGL library for simulating hands in 3-D world

TECHNICAL SKILLS

Languages	Platforms	Tools
C/ C++, Java, Perl, PHP, JavaScript, Sql	Windows, Linux	HTML5, LaTeX , Lex, Yacc, PostgreSQL, MySql

SELECTED COURSES

Applied Computer Science	Topics in Object Oriented Language Implementation, Software Engineering, Compiler Design, Database Systems, Computer Networks, Operating System
Theoretical Computer Science	Quantum Computation, Special Topics in Data Compression, Computational Complexity, Algorithms-2, Theory of Computation, Discrete Mathematics, Data Structures & Algorithms
Machine Learning and Artificial Intelligence	Machine Learning Techniques, Artificial Intelligence & Programming

EXTRACURRICULAR ACTIVITIES AND ACHIEVEMENTS

Mentorship	• **Project Associate for NPTEL online course**: Introduction to Programming in C *(2014)* • **Student Guide, Counselling Service**, IIT-K, in charge of nine first year students *(2011)* • Mentored group of first years working on ACA semester project: 'Movie Recommendation System' *(2014)*
Competitions	• **Won Idea Quest-India**, at Qualcomm amongst all India interns; pitched an idea for social-help web-app • **Yahoo HackU 13**: Designed an app 'Lets Meet' using Google Maps API which suggests a cluster of distinct type of meeting places in proximity based on input provided by a group of users *(Aug,2013)*