

PARUL AGARWAL

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Education

Degree / Certificate	Institution	Year	CPI / Percentage
M.Tech. (Dual Degree)	Indian Institute of Technology, Kanpur, India	2013*	9.6/10.0** (3.84/4.00)
B.Tech. (Dual Degree)	Indian Institute of Technology, Kanpur, India	2013*	8.9/ 10.0** (3.56 / 4.00)
Class 12 : CBSE Board	Kalka Public School, New Delhi, India	2007	88.8%
Class 10 : ICSE Board	Christu Jyoti Convent School, Baghpat, UP, India	2005	92.8%

*expected year of graduation **after completion of 8th semester

Awards And Scholarships

- Received **Google India Anita Borg Memorial Scholarship Award 2012**, awarded to 11 students all over India
- Awarded scholarship to attend **MSR India 2012 Summer School** on Distributed Algorithms, Systems, and Programming
- Awarded scholarship to attend **South Asia Workshop on Research Frontiers** organised by National University of Singapore
- Selected among the 50 students from IIT Kanpur, CalTech, Rice University and École Centrale Paris in the **SURGE Programme** (Summer Undergraduate Research Grant for Excellence) for May - July 2010
- Selected among the 60 students across India in **IPTSE Winter School 2010** organised by Carnegie Mellon University at IIITH and awarded **2nd Best Project Award**
- Awarded **Best Poster Presentation Award** among 300 students in Eureka, the paper presentation contest of Techkriti 2011, the annual inter-collegiate technical festival of IITK

Internships / Work Experience

User-defined Datacube Generation Service (Amazon, Hyderabad, May 2012 – present) (Java, Sql)

Mentors: Shravan Chakamra, Amazon, Hyderabad

- Designed and implemented a user interface to create/edit/view datacube generation metadata for dynamic datacubes
- Implemented a multipart upload of the extract files on S3 and workflow for the complete datacube generation process

HPC: Graph 500 on IBM's Supercomputer Blue Gene/P (IBM-IRL, May 2011 – July 2011) (OMP, MPI, C++)

Mentors: Dr. Yogish Sabharwal, Anamitra Roy Choudhury and Anshul Mittal, IBM India Research Labs, New Delhi

- Analysis of Graph 500 Benchmark 1 ("Search") on IBM's Blue Gene Supercomputer Watson4P
- Implemented and optimized BFS search on a large random graph of size 2^{38} vertices, with average degree of 16
- The work was tested on 32K nodes of supercomputer and was submitted to Graph 500 list of **November 2011 submission**

Machine Learning: Emotion Recognition from Speech (CMU IPTSE Winter School, Dec 2010) (SVMs, AdaBoost, Matlab, Python)

Mentors: Dr. Bhiksha Raj, Carnegie Mellon University and Dr. Kishore S. Prahallad, IIITH India

- Involved extraction of new features from a given sample speech file, classification by machine learning using binary classifiers and selection of best features for various emotion pairs
- Introduced a new classification by integrating SVMs and AdaBoost
- Won **2nd Best Research Project Award** and paper accepted for poster presentation in **Grace Hopper Celebration 2011**

Data Mining and Bio-informatics (SURGE Summer Internship, May 2010 - July 2010) (MySQL, Java, Python, Graphviz)

Mentors: Dr. Harish Karnick, Dr. Arnab Bhattacharya, CSE IITK and Dr. Amitabha Bandyopadhyay, BSBE IITK

- Designed and implemented an algorithm that built tissue specific metabolic networks, gene-regulatory network and find the relation between various genes from them
- Analyzed and predicted transcription factor binding sites on DNA sequences using **p-match algorithm**
- Predicted enhancer sites on DNA sequences and validated them with co-regulated genes

Accepted Posters and Papers

- Grace Hopper Celebration 2012:**
 - Work on "Building tissue-specific metabolic network and gene network" accepted for ACM Student Research Competition
 - Work on "Emotion detection from audio and video" accepted for ACM Student Research Competition
 - Work on "Question Classification" accepted in General Poster Presentation Track
- Grace Hopper Celebration 2011:** Work on "Emotion Detection from Speech using Adaboost and SVMs" accepted in General Poster Presentation Track
- SURGE 2010:** Paper presented in SURGE 2010 on "Predicting tissue specific metabolic networks and building gene-regulatory networks"

Academic Achievements

- Achieved an **All India Rank 408 (AIR)** in **IIT-JEE'08** in which more than 320,000 students appeared (**percentile 99.99**),
- Secured **448th Rank** in AIEEE'07 in which nearly 750,000 students appeared (**percentile 99.99**). Scored the **highest amongst female students** in Delhi
- Secured **All India Rank 132** in National Level Science Talent Search Examination-2007 ,Unified Council
- Qualified FIITJEE Talent Search Examination 2006(**AIR 283**) and 2007(**AIR 236**) organized at national level

Technical Skills

Programming Languages	C, C++, Java, Python, Prolog, Oz
Web Developments	PHP, HTML, JavaScript, MySQL, CSS
Tools	LaTeX, Lex, Yacc, Make, Shell, Eclipse, Matlab, GNU Octave

Course Projects

Indexing and Searching: Space Constrained Approximate String Search (Jan 2012- April 2012) (coding in Java)

- Proposed and implemented a **novel method** of reducing the size of inverted list index structure by discarding lists and combining lists based on certain parameters
- Experiments done on actress names from IMDB site showed that an **accuracy of 98%** was retained with improved query processing time when there was **reduction in 30%** of inverted list index structure

Compilers: Escape Analysis in Java (Jan 2012- April 2012) (coding in Java, Soot framework)

- Implemented a **novel algorithm** for static escape analysis in Java using Soot framework
- Escaping objects were recognised and freed from heap using the *free* statement of FReg JFreeVM

Game Theory: Voting System in India (Jan 2012 – April 2012)

- Modelled Indian voting system, government elections at the constituency level and parliament level
- Was able to formulate it as a game with a 2*2 matrix at parliament level where the players consist of small and big parties

Machine Learning: Question Classification (Aug 2011 – Nov 2011) (Winnow, Perceptron, NB, MaxEnt, SVMs)

- Worked on features like bag-of-words, higher order language features like POS tags, chunk tags and Named-entity Relations
- Analysed and compared the results of above 5 classifiers with SVMs giving the best result of 87.2%

Machine Learning: Emotion Recognition from Audio and Video (Aug 2011 – Nov 2011) (SVMs, AdaBoost, Matlab, Python)

- Analysis of video sequences which combines facial expressions observed visually with acoustic features to automatically recognize five universal emotion classes: Anger, Disgust, Happiness, Sadness and Surprise
- Combined the two modalities at feature and score level to compare the respective joint emotion recognition rates
- Paper accepted for **ACM Student Research Competition** in Grace Hopper Celebration 2012

Compiler Techniques: Compiler for C++ (Feb 2011 – April 2011)

- Designed a **partially fledged compiler** for source language C++, target language as mips and implementation in python
- Implemented features like basic types, arrays, pointers, functions (recursive, function overloading), literals and control structures. Generated 3-address code. Project was nominated for the **Best Project Award** among 16 other projects

Database Systems: Automated Attendance Management System (2011 – April 2011) (MySQL ,Xampp)

- Designed and implemented an automated attendance management system optimized for 3CNF
- Implemented **convenient viewing** of attendance and timetable, viewing students above threshold attendance, giving attendance, ensuring security (**no proxy** attendance) and rescheduling classes by the instructor, maintaining sessions

Operating Systems: Simulation and analysis of various features of OS (Aug 2010 – Nov 2010) (coding in Java)

- Simulated and analyzed different **system calls** and scheduling algorithms using operating system simulator-NACHOS
- Implemented and analyzed performance of different **mutual exclusion algorithms**
- Simulated and evaluated page replacement algorithms for memory management and a fully associative TLB

Extra Curricular Activities/Interests

- Robotics Club**, IIT Kanpur
 - Secretary** for academic year 2009-2010
 - Made an autonomous line following robot in Summer Camp'09 organized by Science and Technology Council, IITK
 - Participated and guided students in robotics events and grabbed consolation **prize** for coding an autonomous robot
- Institute Basketball Team**, Games and Sports Council, IIT Kanpur
 - Team member, Girls Basketball Team since 2008
 - Event Coordinator, Women's Basketball Udghosh'10, the Annual Sports Festival of IITK
 - Won **Bronze Medal** in Inter-IIT Sports Meet'09 and **Bronze Medal** in Women's Basketball Udghosh'10