Rahul Gupta

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Educational Qualifications

2019 (Expected)	Dual Degree (B.Tech and M.Tech)	IIT Kanpur	8.9*/10.0
2014	Class XII (CBSE)	DAV Public School, Kota	94.60%
2012	Class X (CBSE)	DAV Public School, Kota	10.0/10.0

**current*

Scholastic Achievements

- Secured AIR – 174 among 1.26 lakh students in **Joint Entrance Examination (Advanced)** 2014.
- Selected for prestigious **Kishore Vaigyanik Protsahan Yojana (KVPY)** fellowship in Stream SX in 2013.
- Secured Rank – 4 among thousands of students in statewide **Rajasthan Pre Engineering Test (RPET)** 2014.
- Secured 3rd position in FPGA Design Challenge, at Techkriti 2016, Intercollegiate Tech Festival of IIT Kanpur.

Internships

Microsoft – IT, Hyderabad: MAY'17-JULY'17

Software Engineering Intern

- The project aimed to migrate partners with their users from Partner Membership Center(PMC) to Partner Center(PC).
- Studied and Analyzed the architecture of Partner Center comprising of Reseller Web, Service and Frontdoor.
- Formulated the design and Proof of Concept to make a responsive UI using WebCore CSS and Angular JS features.
- Implemented Asynchronous Actions using $q service and post data using $resource for AAD account creation.
- Thoroughly tested the functionality of written code with the help of Jasmine tests and C# unit tests.
- All code was reviewed, perfected, and pushed to production while following agile software development.

Projects

[Blockchain] Distributed App to Log User Activity on OARS AUG'17-DEC'17

Mentored by Prof. Sandeep Shukla. Work accepted for workshop at ISRDC, IIT Bombay.

- Project aimed at logging activities of students, professors and admins on Online Academic Registration System.
- Used PKI to log activities on a privileged and distributed blockchain using Multichain.
- Implemented Principal of Least Privileges on a central MySQL server and a permission server for blockchain stream.

[Computer Systems Security] Securing Zoobar Web Server JAN'17-APR'17

Course Project, CS628, mentored by Prof. Sandeep Shukla

- Studied the architecture of Zoobar Web Server based on OKWS model for building fast and secure web services.
- Exploited security vulnerabilities using Control Hijacking Techniques, Privilege Escalation Techniques, Buffer Overflow and browser-based attacks like SQL Injection, Cross Site Scripting, Cross Site Request Forgery and Cookie Thefts.
- Improved applications security using Stack Canaries, Privilege Separation and Server-Side Sandboxing.

[Compilers] Compiler For Scala JAN'17-APR'17

Course Project, CS335, mentored by Prof. Amey Karkare

- Developed a Scala to NASM Compiler targeted at x86 architecture with support for basic operations, conditional and Iterative statements, arrays, type checking, basic type inference, nested functions and recursion.
- Implemented Lexical Analyzer, Parser, Abstract Syntax Tree, Intermediate Code and Assembly Code Generator.
- Incorporated extra features like default parameter values for functions/classes and lists storage type.

[Operating Systems] Extending NachOS AUG'16-NOV'16

Course Project, CS330, mentored by Prof. Mainak Chaudhuri

- Implemented System calls pertaining to Fork, Exec, Join, Sleep and Exit.
- Implemented UNIX, First in First Out, Round Robin and Shortest Job First job scheduling algorithms.
- Implemented Shared Memory, Semaphores, Condition variables and Page Replacement Algorithms.

[Machine Learning] Important Citations in Paper AUG'17-NOV'17

Course Project, CS771, mentored by Prof. Purushottam Kar

- Aimed to use the content and context of the citation to decide its best reviewers on AI2 Meaningful Citations Data Set.
- Evaluated features like Citations per section, Number of References, Similarity between Abstracts, Pagerank, etc.
- Implemented a novel feature to score the importance of a citation from the referencing sentence using bag of words.
- Compared the performance of SVM with different kernels, Decision Tree and K-Nearest Neighbors.

[Human Computer Interaction] Predicting Laptop User's Gaze JUL'16 – DEC'16

Mentored by Prof. Gaurav Sharma

- Used Pygame for developing UI and Dlib's face and landmark detection algorithms to capture eye patches.
- Trained an SVM over quantized Local Binary Pattern features for predictions.

[Databases] AuctionBase JUL'16 – DEC'16

Course Project, CS315, mentored by Prof. Medha Atre

- Analyzed, parsed and bulk loaded the large volume of data from eBay and designed a good relational schema for it.
- Implemented triggers and various integrity constraints in order to maintain data integrity and consistency.

[Web Application] Eliza Plus - Online Chatbot JUL'16 – NOV'16

Course Project, CS251, mentored by Prof. Arnab Bhattacharya

- Developed a web application capable of sending emails, storing personalized user's data, stream videos etc. with login.
- Streamlined Eliza implementation in JavaScript with syntax matching and AJAX calls to interact with server.
- Used web scraping, GeoIP Database for weather info, google news API etc. in Django app to relay information.

[Data Mining] Searching Tool for Related Queries MAY'16 – JUN'16

Mentored by Prof. Nitin Gupta

- Scraped an online support forum by tracking AJAX requests and using beautiful soup with multithreading in python.
- Used Word based indexing and calculated scores as a function of common words and penalty for short doc matches.
- Used these Term Frequency– Inverse Document Frequency Scores to rank the questions and return the top matches.

[Machine Learning] Wildlife Conservation Project DEC'15 – JAN'16

Mentored by Prof. Prabhakar TV

- This project aims to identify areas vulnerable for tigers in a national park to minimize their killing by poachers.
- We generated our data facilitating formation of clusters and incorporated attributes like terrain, festivals, time etc.
- Visualized data using Google Maps API and classified it using SVM (Support Vector Machine).

[Image Processing] T-Shirt Recognition MAY'15 - JUL '15

Mentored by Programming Club, SNT Council, IIT Kanpur

- This project simplifies buying a T-Shirt of one's liking by just taking a photograph and uploading it on the software.
- Same or similar T-Shirts appear in the results with their price comparison across websites with link to buy them.
- Developed a Windows Desktop Application using C# in visual studio and scraped T-Shirt data in python.
- Used SSIM technique with image filters to compute similarity index between images.

[Web Application] Game to Cure Depression MAY'16 – JUN'16

Mentored by Prof. Nitin Gupta

- Prepared a game aimed to deliver cognitive bias modification by watching happy people to treat depression.
- Game is implemented using JavaScript and AJAX calls while scores are kept in sync with server based on Django.

Technical Skills

Programming Languages	C, C++, Python, HTML, CSS, PHP, JavaScript, BASH, SQL
Software, Utilities and Libraries	Matlab, LaTeX, Django, Visual Studio, Git, Z3 Solver, Angular JS

Relevant Courses

Computer Science: Computer Systems Security, Compiler Design and Analysis, Theory of Computation, Operating Systems, Machine Learning, Computer Networks, Computer Organization, Database Management Systems, Data Structures and Algorithms

Mathematics: Discreet Mathematics, Probability and Statistics, Abstract Algebra, Linear Algebra, Differential Equations, Real and Multivariable Calculus

Positions of Responsibility

Student Guide, Counselling Service, IIT Kanpur JUN '15 – APR'16

Actively involved in counselling of 6 freshmen, helped and guided them in their induction to the institute.
Supervised registration and orientation of more than 800 students assisted by other student guides.

Secretary, Debate and Discussion Society AUG '15 – APR'16

Conducted debate sessions like parliamentary debates, group discussions and model united nations.

Extra-Curricular Activities

- Part of the team that secured first position in inter-pool Mock United Nations event in GALAXY '14.
- I like to read fiction and play cheerful songs on my acoustic Guitar.