Ayush **Tulsyan**

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EDUCATION

April 2018	B.Tech (Computer Science And Engineering)	IIT Kanpur	7.5/10.0
April 2014	Class XII (Central Board for Senior Education)	B.P.S. Burhanpur	89.60 %
April 2012	Class X (Central Board for Senior Education)	N.M.S.S. Burhanpur	10.0/10.0

ACADEMIC ACHIEVEMENTS

- Secured AIR - **197** in **JEE (Advanced) 2014** among 125K Candidates
- Secured **KVPY** Scholarship 2014 under stream SX with a rank of **226**
- Secured **99.97 percentile in JEE Mains 2014** Test among 1.5 Million Candidates
- Received **A* grade** for exceptional performance in **Data Structures and Algorithms** course.
- Amongst top 300 students qualified for **Indian National Astronomy Olympiad 2014** conducted by **HBCSE**.

INTERNSHIP

SUMMER ANALYST

May '17 - July '17

Goldman Sachs Services Pvt Ltd, Bengaluru: Data Architecture Team in Technology Division

- Explored the possibility of **SQL-on-Hadoop** replacing the current data warehousing solution used by the Enterprise. Specifically focussed on **Presto**, which is an open source **distributed SQL query engine** primarily used for processing *Big Data*
- Evaluated Presto against **Sybase IQ** through comparing them using queries, guidelines, and dataset provided by **TPC-DS Benchmark**, while *assimilating the enterprise's context* by adding frequently used queries, UDFs, and datatypes to query set
- Automated the process of *data generation, migration, creating tables and indices, query execution and recording of evaluation time* in conditions which include variation in *scale of data, number of concurrent users and resource available for computation*
- Presented **comprehensive analysis** of factors contributing to decision of deploying Presto to **four MDs from GS's New York Office**

PROJECTS

JAVA TO MIPS COMPILER:

Jan '17 - April '17

Course Project for course CS335A: Compiler Design, under Prof. Amey Karkare

Github

- An end-to-end compiler in Python for a subset of Java Language to produce instructions in MIPS Assembly
- Implemented a parser using Python Lex and Yacc (PLY) to build symbol table, check syntax errors and suggest changes.
- Incorporated support for recursion, dynamic memory allocation, multi-dimensional arrays and preliminary OOP.

RAILQUERY:

Jan '17 - April '17

Course Project for course CS315A: Principles of Database Systems, under Prof. Medha Atre

Github

- Implemented an ANNE(Angular, NodeJS, Neo4J, Express) stack based railway enquiry platform using graph based database
- Designed the graph structure to improvise query response time on standard queries like train between stations, connecting trains and fetching train route. Further fine tuned it for a seamless user experience by incorporating indices.

NACHOS OPERATING SYSTEM:

July '16 - Nov '16

Course Project for course CS330A: Operating Systems, under Prof. Mainak Chaudhuri

Github

- **Extended** the **NachOS** operating system to perform basic operating system functions including **Fork, Join, Sleep, Exec** and **Exit**.
- Implemented and evaluated performance of various algorithms for scheduling processes including **Non-Preemptive FCFS, Shortest Job First, Pre-emptive Round Robin** and **UNIX Scheduling**.
- Implemented Shared Memory Allocation, **Demand Paging** and Page Replacement Algorithms including **FIFO, LRU and LRU-Clock** and analyzed their performance.

BAJA SAE, IITK MOTORSPORTS:

Jan '15 - Jan '16

Faculty Advisor: Prof. Avinash Kumar Agarwal, Dept of Mechanical Engineering

Report

- Amongst the 24 members of the team who worked on a **yearlong project** which involved **designing and manufacturing** an **All-Terrain Vehicle** and competed in **Baja Student India '16**, held in Noida in Jan '16.
- **Lead the Chassis subsystem** during the designing phase of **3 months during summer**. **Optimized the strength and weight** of the roll cage by **virtual designing and simulation**. Intensively simulated the CAD Model for ensuring the **reliability of structure and safety of driver**.
- The Team stood 13th in Overall ranking, 6th in the Design event, 4th in both Acceleration and Maneuverability event.

OTHER MINOR PROJECTS:

- **Identifying Vulnerabilities and Secured Zoobar Application:** Identified potential exploitable vulnerabilities in web server including buffer overflow, Phishing, Cross Site Request Forgery, Profile Worms, Password theft. Improved application's security using separate process for different services, jailed processes and user/group permissions.

- Made a **html and a proxy server** for GET requests in C++ as a project under Course **Computer Networks** using a Parsing Library.
- Analyzed and Suggested Improvements for **Stable Marriage Algorithm** as a project in course **Discreet Mathematics** under Prof. Rajat Mittal. Report

ACHIEVEMENTS IN PROGRAMMING

- Secured Rank **25th** in **ACM-ICPC Chennai Onsite 2016** among 120 teams and Rank **50th** in **Amritapuri Onsite 2016** among 391 teams shortlisted through previous rounds and then further qualified for **ICPC India-Final 2016**
- Secured Rank **46th** in **ACM-ICPC India Regionals, Online round 2016** among 3000 teams from over the country.
- Secured Rank **221th** in **Snackdown 2017 Online Elimination** among 3400 teams selected among 24000 teams.
- Secured Rank **304th** in **Snackdown 2016 Online Elimination** among 3600 teams selected among 13000 teams.
- Best Ranked 212 internationally among 8400 people in Codeforces Round 360 Div 2.
- Rating of 8402.38 for long contests on Codechef. (10 days long monthly programming contests)
- Achieved an overall rating of 2122 points on Codechef, thus being classified as a 5 star contestant.

POSITIONS OF RESPONSIBILITY

Feb '16 - July '16	**Subsystem Head, Chassis, IITK Motorsports**
Apr '15 - Apr '16	**Academic Mentor (ESC101A), Counselling Service**
Jun '15 - Apr '16	**Student Guide, Counselling Service**

TECHNICAL SKILLS

Programming Languages	C, C++, Python, Bash
Programming Languages (Familiar):	Java, HTML, CSS, JavaScript, PHP, MatLab, Verilog, Assembly
Software and Utilities:	Git, LaTeX Linux Shell Utilities

RELEVANT COURSES

Computer Science:	Randomized Algorithms, Design and Analysis of Algorithms, Operating Systems, Compilers, Computer Systems Security, Computer Networks*, Machine Learning Techniques*, Visual Recognition*, Data Structures & Algorithms, Theory of Computation, Computer Organization, Database Systems, Computing Laboratory – I & II
Others:	Discrete Mathematics, Linear Algebra & Ordinary Differential Equations, Analytical Calculus, Abstract Algebra, Intro to Logic, Probability & Statistics, Electronics, Intro to Biotechnology, Development Economics

EXTRA-CURRICULAR ACTIVITIES

Competed in **Code.Fun.Do 2015** and made an application which intends to smoothen out **document handling**.
Designed a Website for Institute's SAE team.
Member of team which received Best Sectional Project Award in course project of Manufacturing Processes(TA201A)