# Ayush Tulsyan

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# **EDUCATION**

April 2018B.Tech (Computer Science And Engineering)IIT Kanpur7.5/10.0April 2014Class XII (Central Board for Senior Education)B.P.S. Burhanpur89.60 %April 2012Class X (Central Board for Senior Education)N.M.S.S. Burhanpur10.0/10.0

### **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 13<sup>th</sup> in Overall ranking, 6<sup>th</sup> in the Design event, 4<sup>th</sup> 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.

# ACHIEVEMENTS IN PROGRAMMING

- Secured Rank 25<sup>th</sup> in ACM-ICPC Chennai Onsite 2016 among 120 teams and Rank 50<sup>th</sup> in Amritapuri Onsite 2016 among 391 teams shortlisted through previous rounds and then further qualified for ICPC India-Final 2016
- Secured Rank 46<sup>th</sup> in ACM-ICPC India Regionals, Online round 2016 among 3000 teams from over the country.
- Secured Rank 221<sup>th</sup> in Snackdown 2017 Online Elimination among 3400 teams selected among 24000 teams.
- Secured Rank 304<sup>th</sup> 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
Programming Languages (Familiar):
Software and Utilities:

C. C++, PYTHON, BASH JAVA, HTML, CSS, JAVASCRIPT, PHP, MATLAB, VERILOG, ASSEMBLY GIT, LATEX LINUX SHELL UTILITIES

## **RELEVANT COURSES**

Computer Science: Randomized Algorithms, Design and Analysis of Algorithms, Operating Systems, 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)