



Ashutosh Kumar Verma
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UG Third Year (B.Tech.)
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Examination	University	Institute	Year	CGPA/%
Graduation	IIT Bombay	IIT Bombay	2018	7.91
Intermediate/+2	ISC	City Montessori Inter College, Lucknow	2016	94.17
Matriculation	ICSE	City Montessori Inter College, Lucknow	2014	95.67

RESEARCH INTERNSHIP

Automatic Repair of SonarQube Bugs in Java Projects [May-July'18]
Guide: Prof. Martin Monperrus *KTH Royal Institute of Technology, Sweden*

- Used INRIA's Spoon library to create a system to automatically repair SonarQube bugs in java code
- Implemented automatic repair and test cases for 5 different Sonar-Java bugs
- The System repaired 102 Sonar violations and merged 6 pull requests in Spoon's master branch
- Contributed to development of Sniper Mode of Spoon for clean source-to-source transformation
- Found and reported several inconsistencies in source position of spoon elements

TEACHING EXPERIENCE

Teaching Assistant: Data Structures & Algorithms Lab [Autumn'18]
TA for Prof. R.K. Shyamasundar *IIT Bombay*

- Responsible for setting algorithmic problems, evaluation and helping students in the lab

TECHNICAL PROJECTS

Notes sharing Android application [September-November'18]
Course Project | Guide: Prof. S. Sudarshan *IIT Bombay*

- Creating a file sharing app on PostgreSQL based on backend with JDBC API
- The app includes options to upload/download files for users, add/remove tags, remove spam and grant/revoke moderator privileges. Used trigram search to deal with typos in queries

Compiler for C-like Language [January-April'19]
Course Project | Guide: Prof. Uday Khedkar *IIT Bombay*

- Developed a compiler for a C-like language. Used Lex and Yacc for tokenising and parsing, to create Abstract Syntax Trees, symbol tables and later translate to MIPS assembly code
- Supported functionalities like function calls, if-else statements, loops and arithmetic expressions

Courspace [September-October'17]
Course Project | Guide: Prof. Kavi Arya *IIT Bombay*

- Developed a Web app supported by a Django backend to provide a method for interaction between students and professors
- The web app serves as interface for students and teachers to discuss about the course. Provides options for homework assignments submission and further remarks on it from the teachers

Railway Controller using VHDL [January-April'18]
Course Project | Guide: Prof. Supratik Chakraborty *IIT Bombay*

- Designed and implemented a railway signaling controller on a FPGA board using VHDL
- Used FPGALink library for communication with a computer running backend written in C
- Implemented UART communication to connect boards directly to exchange information

2D - Gravity Simulator

[February-March'17]

Course Project | Guide: Prof. Amitabha Sanyal

IIT Bombay

- Implemented a N body gravity simulator using functional programming in Racket
- Achieved $O(N \log(N))$ upper bound for each time step using divide and conquer strategy adapted from a research paper by Andrew W. Appel titled "An Efficient Program For Many-Body Simulation"

Minesweeper Game using Racket

[January-April'17]

Course Project | Guide: Prof. Amitabha Sanyal

IIT Bombay

- Used Racket/Scheme programming language to develop the classical game of Minesweeper with randomized positions of mines, timer and ability to flag mines
- Used Racket Graphical Interface Toolkit to make the game look attractive and user friendly

Other Projects

- **Rule based Syntactic Parser** (Course Project | Guide: Prof. Amitabha Sanyal): Implemented a syntactic parser for a small rule-based language given its grammatical rules [March-April'16]
- Designed a **Tele-Communication System** (Course Project | Guide: Prof. Bhaskaran Raman) which transmitted bitstreams using color detection and with error correction. [January-February'18]
- **XLR8** (Electronics Club, IIT Bombay): Designed a manually controlled bot capable of negotiating obstacles in its path in stipulated amount of time for XLR8 competition [September'16]

ACADEMIC ACHIEVEMENTS AND SCHOLARSHIPS

- Secured **All India Rank 14** in **KVPY SA** Stream out of 60,000 candidates [2014]
- Achieved **25th place** among 255 teams and **Honourable Mention** in **ACM International Collegiate Programming Contest**, Amritapuri Regionals 2017-2018 [2017]
- Secured **All India Rank 221** in **JEE Advanced 2016** among 200,000 candidates [2016]
- Awarded **Advanced Performer's (AP)** grade in **Multivariable Calculus** at IIT Bombay [2016]
- Awarded the **National Talent Search Examination (NTSE)** scholarship by National Council of Educational Research and Training (NCERT), Government of India [2014]

TECHNICAL SKILLS

Programming: Proficient : C/C++, Java

Moderate : Python, SQL, Bash, Scheme, Assembly

Softwares : Spoon, Matlab, L^AT_EX, Git, Make, AutoCAD, Gnuplot, Linux

KEY COURSES UNDERTAKEN

Computer Science: Data Structures & Algorithms(+ Lab), Software Systems Lab, Operating Systems(+ Lab)*, Database(+ Lab)*, Compilers(+ Lab)***, Computer Architecture(+ Lab)*, Discrete Structures, Automata Theory**, Artificial Intelligence**, Abstractions and Paradigms for Programming(+ Lab), Logic for Computer Science, Digital Logic Design(+ Lab), Cryptography

Mathematics Real Analysis, Multivariable Calculus, Linear Algebra, Differential Equations

* To be completed by November'18

** To be completed by April'19

EXTRA-CURRICULARS

- Won the **1st position** in **Logic General Championship** conducted by MnP Club, IIT Bombay
- Won **Gold medal** in Inter-Hostel **Chess General Championship** [2016]
- Became a buddy for exchange students from other countries, to help them adjust to campus life
- Awarded **Hostel Color** for excellent contribution to technical activities in Hostel 2
- Solved more than **500 algorithmic problems** on competitive programming websites like Codeforces, Sphere Online Judge, Timus Judge, PKU JudgeOnline, Atcoder, Project Euler, etc