ROHIT RANJAN

Senior, Dept. of Computer Science & Engineering
IIT Kanpur

E-mail: rohitrjn629@gmail.com
Github: RohitRanjangit
Mobile: +91-96805-49779

Education

2018–present **Bachelor of Technology**, *Indian Institute of Technology*, Kanpur, *CGPA- 9.23*/10*
Major in Computer Science & Engineering

2018 **Grade XII**, *Krishna Public School*, Patna, *Result: 92%*

2016 **Grade X**, *Jawahar Navodaya Vidyalaya*, Saran, *CGPA-10.0/10.0*

Work Experience

May'21–present **Cisco Systems Inc, Technical Undergraduate Intern**
report *Software Developer,Team Falcon,* Mentor: Chinmaya Kumar Panda

- Performed Load testing of **Broadworks** User billing Apis, got successful smoke test outcomes
- Designed **Grafana** dashboard to show User Billing Api performance statistics with analysis of available metrics like request volume, report reliability from influxDB data source
- Scripted **Jmeter** jmx code from scratch to create stress on server handling User Billing Apis

May '19–Jul' 19 **Summer of Code, IIT Kanpur**
github *IIT Kanpur*, Supervisor: Prof. Sandeep Shukla

- Developed a dynamic and scalable web application using **Django** from scratch as an initiative to support NGOs of India by keeping track of records of users and their donation history
- Implemented various functionalities that allows registered users to choose from various NGOs to donate, as well as the registered NGOs to list their mission and necessities
- Developed whole Backend using Django and Django-REST, used ReactJS to develop Frontend
- Established a Payment Portal to handle all type of transactions using Paytm payment API

Open Source Contribution

Apr'20–May'20 **Boost C++ Organization**
github *Software Developer*, Github Boost.Astronomy

- Integrated Boost.Units with the base coordinate system and restructured all the classes to make them compatible with Boost.Units to provide a robust astronomical coordinate system
- Implemented **3D-Arithmetic Operations**(eg. Unit vector, CrossProduct etc..) for the existing Astronomical Coordinate system using Boost::Geometry and Boost::Units library
- Wrote unit tests for existing and newly added features

Projects

Jan '21-May'21 **C-Compiler-CS335: arcx86**
github *Course Project, Compiler Design*, Prof: Amey Karkare

- Implemented a fully working Standard-**C** language compiler in **Python3** from scratch supporting almost all standard C Syntax and functions, with target **X86_64** Intel Acrchitecture
- Wrote complete code for conversion of intermediate code to target specific architecture (**Intel i7**) **Assembly** language with efficient register allocation and stack space optimization
- Supported advanced features like struct return, infinte level of recursion with constant fold optimization, got almost same compilation time and accuracy comparing to gcc compiler
- Used Python3-pip PLY library to implement scanner and parser, made use of Hierarchial Symbol table structure concept for semantic analysis and intermediate code generation

Jan '21-May'21 **Computer Networking**
github *Assignments, Computer Networks*, Prof: Swaprava Nath

- Implemented **HammingCode**(n,k) algorithm to encode pixels of an image and devised an self-correcting implementation for decoding and error correction
- Established two way communication between two servers using Socket API, used Stop & Wait ARQ(Automated Repeat reQuest) and **Go-Back-N ARQ** protocols for message transfer. Validated incoming messages through CRC(Cyclic Redundancy Check)
- Integrated Distributed Bellman-Ford Shortest Path Routing Algorithm for robust generation of **routing tables** at hops in Network Topology of size of n routers

Sep '20-Dec'20 **Building GemOS**

github *Course Project, Operating Systems*, Prof: Debadatta Mishra

- Implemented file system syscalls in **C** including open, write, pipe, dup etc.
- Constructed multilevel **paging management** system for syscalls like mmap, munmap and mprotect with support for huge page of size 2 Mega Bytes
- Developed a message queue mechanism that facilitates **inter-process communication** using pipes, included features like broadcasting,blocking messages
- Designed a simple **debugger** with support for features like setting/removing breakpoint, retrieval of register info, backtrace to analyse call stack of process

Jan '20-May'20 **Decrypting Caves Game**

github *Course Project, Modern Cryptology*, Prof: Manindra Agarwal

- Explored and Analysed different existing classical and modern **Cryptographic** methods and their weaknesses
- Completed all 7 levels of game by designing **chosen plain-text** attack for weaker models of AES,DES and RSA and extracted level entry keys to decrypt data.

Academic Achievements

2018-19 **Academic Excellence Award** , amongst Top 6% students of the department

2018 **Academic Excellence Award** , given to Top 10% of the batch

Present **Expert Rated**, on codeforces with maximum rating of 1673

2018 **All India Rank 367**, Joint Entrance Examination Mains among 1.5 million candidates

2019 **All India Rank 1** , Indian Engineering Olympiad

2018,19 &20 **Samsung Star Scholar**, awarded to students graduated from J.N.V and performing academically well in IITs

Technical skills

Programming: C/C++, Java, Python3, Haskell, Bash Scripting, Verilog

Development: HTML5, CSS, Javascript, SQL, React Native, InfluxDB

Utils/Platform: Linux Shell Utilities, Git, Vim, Matlab, Octave,LaTeX

Libraries/Apis: ScoketAPI, Numpy, Matplotlib, Pandas, TensorFlow, Scipy

Relevant Coursework

Data Structures and Algorithms*	Fundamentals of Programming in C*	Multivariate Calculus*
Linear Algebra	Probability*	Discrete Mathematics
Computer Organization	Operating Systems*	Software Development and Operations
Compiler Design*	Modern Cryptology*	Database Management System*
Introduction to ML*	Computer Networks*	Computational Methods in Engg.*

(*): excellent performance in course

Mini/Self Projects

Jan '20–Mar '20 **FlappyBirdAI**, *github*

- Created a simple bird game using Python Pygame library and Implemented Neat AI algorithm

Apr '21–May'21 **StockMarket**, *github*

- Designed Schema for a stock market and analysed query runtime for different database engines

Miscellaneous

Aug '19 Senior **Web Executive** in Udghosh'19, IIT Kanpur

Oct '20 Developed a **decoder** in Haskell to decipher monoalphabetic substitution ciphers

Dec '20 Wrote a python script to cartoonize an image using **opencv** library[github]

Jan '20 **Mentor** in ACA project organized by Dept. of Computer Science & Engineering

May '21 Created grafana panels to analyse system statistics, used python **psutil** to get data