Chinmay Rai

ACADEMIC DETAILS

Year	Degree/Board	Institute	GPA/Marks (%)
---	B. Tech and M. Tech in Computer Science & Engineering	Indian Institute of Technology, Delhi	8.688
2016	Central Board of Secondary Education	Shiv Jyoti School, Kota	95.4/100
2014	Central Board of Secondary Education	Holy Cross School, Kapa, Raipur	10/10

SCHOLASTIC ACHIEVMENT

- **Demonstrated Proof of Concept** of Accident Maps at Int'l. Conference on Information & Comm. Tec. & Development 2019
- **Student Exchange:** Selected among 40 students from IITD chosen for *Academic Exchange to* **POSTECH, South Korea**
- **Department Change:** Granted change of department to **Computer Science** for exceptional academic performance
- **Summer Undergraduate Research Award:** Recognition for my Project on *Automatically Curated Accident Maps* in 2018
- **Merit in Academics:** Awarded **Merit** Certificate of Excellence in Academics for both semesters in 2016-17 at IIT Delhi
- **KVPY Fellow:** AIR 247(GE), Awarded the highest recognition in the country at school level by IISc and Govt. of India
- **Olympiads:** Secured a Place in National Top 1% in Astronomy and State Top 1% in Physics & Chemistry IAPT Olympiads

INTERNSHIPS

Amplus Solar, Gurgaon (May'19 - Jul'19): Solar Potential Estimation (per-residence) & Detection of shadow on PV modules
- *Solar Potential*: Extracted Building footprints using satellite images from OSM & refined them using **OpenCV** for estimation
- *Shadow Detection*: Designed a system to analyse the real-time parameters from all plants and estimate the losses incurred

ACADEMIC PROJECTS

Independent Projects

- **Optimal Mapping for CNN Accelerators** (Prof. Smruti Sarangi) (Ongoing): Optimization of Compiler for CNN accelerators
  ◦ Developing a tool to provide the optimal *mapping of the compute operations to the accelerator hardware* in space and time
  ◦ Tool provides mapping with optimal energy/latency for a given CNN layer and a given accelerator architecture
- **Automatically Curated Accident Map** (Prof. Rijurekha Sen) (Apr' 18 - Dec' 18): NLP-Based Information Retrieval
  ◦ Developed a SVM classifier for segregating accident related articles & extracted relevant sentences using **Trigger Verbs**
  ◦ Used Regular Expression and Named Entity Extraction on **relation triplets** for extraction of temporal & spatial Information
- **Digital Certification using Blockchain (**Prof. Rijurekha Sen) (Jan' 19 - Apr' 19): Verifiable & Secure Digital Certification
  ◦ Developed a **full-stack** app that provides controlled access of certificates using Smart Contracts on **Ethereum Blockchain**

Course Projects

- **AI Bot for Cannon** (Prof. Mausam) (Oct' 19 - Dec' 19): *Won the AI Bot tournament in the class amongst 60 teams*
  ◦ Designed an **adversarial** AI bot for the game of Cannon which uses **minimax algorithm** and an empirical utility function
- **Medical Diagnosis using Bayesian Net** (Prof. Mausam) (Oct' 19): *Model for Diagnosis of disease using observed symptoms*
  ◦ Implemented a module to learn the weights of a Bayesian net of diseases & symptoms using **Expectation-Maximization**.
- **Fashion-Image Captioning** (Prof. Suha Kwak) (Nov' 18): *Transfer-Learning on a pre-trained **ResNet** for apparel captioning*
  ◦ Trained a multi-task ResNet on 0.2M apparel images for classification into various Category (Torso/Bottom), style & shape
- **Reward Prediction in Breakout Game** (Prof. Parag Singla) (Apr' 19): *Reward prediction using elapsed Visual frames info.*
  ◦ Implemented a **Convolutional Network** to predict the future reward given an incomplete set of visual frames of game-play
- **Secured Chat Application** (Prof. Aaditeshwar Seth) (Sept' 19): *Java Chat application using **Socket programming***
  ◦ Implemented a Server-client based Chat App using **public-private key** for encryption & **digital Signature** for authentication
- **Decentralised Application** (Prof. James Won-Ki Hong) (Nov '18): *Smart Contract based D-App for parking management*
  ◦ Implemented a full-Stack, peer-to-peer application with a HTML/JS front-end & Solidity back-end for trading parking slots
- **Matrix Multiplication on Hadoop** (Prof. Yu Hwanjo) (Sept' 18): *Big-Data operation on the Hadoop Distributed File System*
  ◦ Developed a scalable multiplication module for multiple matrices from single source using the **Map-Reduce** methodology
- **Containers in xv6 Operating System** (Prof. Smruti Sarangi) (Apr '19): *Virtualisation of the xv6 by creation of Containers*
  ◦ Implemented a framework for Container management, scheduling compute resources and memory allocation in the xv6
- **Parallelized Single Value Decomposition** (Prof. Subodh Sharma) (Mar '19): *CUDA - based framework for efficient SVD*
  ◦ Implemented a parallelized module for computation of eigenvalues of a matrix by utilising GPU's interfaced using CUDA
- **Toy Prolog Interpreter** (Prof. Sanjiva Prasad) (Apr' 18): *Ocaml-based interpreter using Ocamllex and Ocamlyacc*
  ◦ Implemented Toy Prolog Interpreter with a **back-tracking** strategy to explore resolution space, when a sub goal fails
- **ARM Processor** (Prof. Anshul Kumar) (Feb' 18 - Apr' 18): *Hardware implementation of 32-bit **ARMv7** processor on a FPGA*
  ◦ Designed and implemented the Datapath & Control to execute all data processing and transfer from v7 instruction set

TECHNICAL SKILLS

• **Languages:** Python, C++, Java, OCaml, JS, Solidity, SQL, HTML, Prolog
• **Tools:** Hadoop, Spark, pThreads, OpenMP, CUDA, Bitcoin Core Client, Ethereum Client

RELEVENT COURSES

Data Structures, Discrete Mathematical Structures, Digital Logic & System Design, Computer Architecture, Operating Systems, Introduction to Parallel & Distributed Programming, Programming Languages, Theory of Computation, Algorithms, Computer Networks, Principles of AI, Machine Learning, Deep Learning, Meta Learning, Computer Vision, Big Data, Blockchain & Cryptocurrency, Introduction to Economics, Calculus, Linear Algebra & Differential Equations, Optimization Methods, Probability & Stochastic Processes, Software Design Practices in Computer Science

EXTRA CURRICULAR ACTIVITIES

• **Quizzing: Winner**, Ad Basics, Institute-level event; **Second Runners-up, League Quiz,** year-long Multi-genre Tournament
• **Quizmaster: Dashdwaar (2019, 2020)**, multi-round Literary quiz for freshmen featuring pop culture, Mythology & Cinema
• Successfully completed a **Korean lang.** beginner course & Represented India at *World culture awareness initiative* in Korea
• **Aquatics**: Integral part of the campaign of Water Polo team in BSA General Championship in 2017-18, 2019-20

POSITION OF RESPONSIBILITY

• **Hostel Literary Club Representative** (2017-18): Won the **Best Representative Award** amongst 13 for stellar performance
• **Student Mentor** (Jan' 19 - present): Mentoring 6 freshers by guiding them on academic & non-academic fronts at the Institute