

# Arham Chopra

Senior Undergraduate  
Department of Computer Science and Engineering  
Homepage : arhamchopra11.bitbucket.io

Linkedin: arhamschopra  
Email : arhamschopra@gmail.com  
Mobile : (+91) 9415-940-618

## EDUCATION

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- **Indian Institute of Technology Kanpur** Kanpur, U.P., India  
*Bachelors in Computer Science and Engineering; CPI: 9.7\*/10* Aug 2014 – July 2018
- **Emmanuel Mission School** Kota, Rajasthan, India  
*Intermediate(+2), Central Board of Secondary Education; Percentage: 95.4/100* Aug 2012 – May 2014
- **Choithram International School** Indore, M.P. , India  
*International General Certificate of Secondary Education; Percentage: 91.8/100* Aug 2010 – May 2012

## SCHOLASTIC ACHIEVEMENTS

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- Recipient of **Letter of Appreciation** by **UG office**, for commendable academic performance, 2015
- **All India Rank 114** in **IIT-JEE Advanced** among 150 thousand candidates, 2014
- **All India Rank 588** in **IIT-JEE Mains** among 1.4 million candidates, 2014
- Recipient of **Kishore Vaigyanik Protsahan Yojana Fellowship** with **All India Rank 177**, 2014
- **National Rank 81** in **National Science Talent Search Examination**, 2014
- Among **top 1%** in Rajasthan in National Standard Examination in Physics, 2014
- **International Rank 15** in 1<sup>st</sup> level of National Science Olympiad, 2014

## EXPERIENCE

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- **Nutanix** Bengaluru, India  
*Member of Technical Staff Intern* May 2017 - July 2017
  - **Kafka Benchmark**: Designed a config based python framework to automate the benchmarking of metrics like CPU and memory usage, throughput rate for **Apache Kafka** through JMX beans and **confluent-kafka-python module**
  - **Kafka Library**: Built a library module to interact with Kafka in terms of message communication through different modes using the confluent-kafka-python module. Also supported management functionality like CRUD operations over topics, safe removal operations over nodes and topics partition rearrangement operations over a cluster
  - **Client APIs**: Implemented bulk and stream APIs for reading data from Kafka via different modes using websockets
  - Received a pre-placement offer at the end of the internship period
- **Elanic** Bengaluru, India  
*Developer Intern* May 2016 - July 2016
  - **MongoDB**: Built a **node.js** module to support atomic transactions in **MongoDB** including features like savepoint, commit, rollback by extending **Mongoose**. Used **Redis**, as in-memory database, to implement functionality of redo logs in Oracle, ensuring atomicity and isolation. Supported some validation checks for partial consistency
  - **Subsidiary**: Built a **Restify.js** based back-end for Barcode app and designed a website for Elanic Premiere League
- **Indian Institute of Technology Kanpur** U.P. , India  
*Teaching Assistant* Aug 2017 - Nov 2017
  - Teaching assistant for the course *Data Structures and Algorithms* under Prof. Sumit Ganguly
  - Involved in assisting the professor in creating and evaluating assignments, exams for a class of 230 students

## PROJECTS

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- **Decentralized File Storage System**  
*Computer Networks, Prof. Dheeraj Sanghi* Oct 2017 - Nov 2017
  - Designed a decentralized storage system that uses client supplied space to store information in a distributed fashion
  - Designed an application layer protocol for communication with clients via upload, download, and copy requests
  - Implemented replication (via copy functionality) during upload to increase availability of data and prevent data loss
  - Added support for addition of new clients, and authentication to limit file access for different clients

## • Small Variance Asymptotics

*Probabilistic Machine Learning, Prof. Piyush Rai*

*Aug 2017 - Nov 2017*

- Studied a subset of **non parametric bayesian techniques** which are based on **dirichlet process** and its variants.
- Also studied different sampling-based inference techniques used in extracting data from them like Gibbs Sampling, Metropolis Hastings, etc. and real-life interpretations like Chinese Restaurant Process, and Indian Buffet Process.
- Studied **small variance asymptotics**, used to achieve the inference speed of parametric techniques while retaining features of the non-parametric domains. Implemented some of these techniques in python on toy datasets

## • Almost-C-Compiler

*Compiler Design, Prof. Amey Karkare*

*Jan 2017 - May 2017*

- Implemented minimal features of a C Compiler targeting **MIPS Architecture** using python framework **PLY**. Tested the correctness of generated code for programs like quicksort, ackermann, mergesort, etc.
- Added support for features like type checking and casting, global and multidimensional arrays, pointers and I/O

## • Finding Security Flaws in Zoobar Webserver

*Computer Systems Security, Prof. Sandeep Shukla*

*Jan 2017 - May 2017*

- Explored the security flaws like control hijacking, privilege separation for Zoobar Web server in a series of assignments
- Performed simple attacks like **buffer overflow**, **XSS**, **CSRF**, **SQL-injection** to gain control over the system
- Implemented mitigation techniques like **stack canaries**, **server-side sandboxing**, **privilege and access control**

## • RailQuery

*Principles of Database Systems, Prof. Medha Atre*

*Jan 2017 - May 2017*

- Implemented miniature version of rail enquiry system using **Neo4j** database with data obtained from railway API.
- Designed an **ANNE stack** based rail enquiry website, using MVC framework, to answer queries like train between stations, train routes, all directly reachable stations, connecting trains using proper DB structure and indices

## • Delving into UNIX with NachOS

*Operating Systems, Prof. Mainak Chaudhari*

*Aug 2016 - Dec 2016*

- Implemented some parts of the **Standard System Call Library** like fork, join, exec, sleep, exit, etc. in NachOS
- Implemented and evaluated performance of process scheduling algorithms (UNIX, RR, FCFS, etc) in varied workloads
- Implemented the **virtual memory** and different dynamic page allocation strategies of the UNIX operating system such as LRU, LRU Clock, FIFO, etc. and evaluated the performance of each in varied workload environments

## • Other Projects

- Combining Inpainting with Image Translation, Voice Command Recognition System, Stock Market Prediction, Meetup Scheduler, Introduction to Cryptography,

## SKILLS

- **Programming Languages:** C, C++, Python, Node.js, Scala, Bash
- **Tools and Frameworks:** Git, Vim, Matlab, Octave, L<sup>A</sup>T<sub>E</sub>X, Postman, Robomongo, Django, Pytorch, Wireshark
- **Databases and Operating Systems:** MongoDB, Redis, MySQL, SQLite, Neo4j, Windows, Linux

## RELEVANT COURSES

*, Functional Programming	*, Modern Cryptography	*, Computer Architecture
A, Computer Systems and Security	A, Computer Networks	A, Operating Systems
A, Randomized Algorithms	A, Probabilistic Machine Learning	A, Compilers
A*, Design and Analysis of Algorithms	A, Machine Learning Techniques	A, Theory of Computation
A, Databases	B, Visual Recognition	A*, Data Structures and Algorithms

\*Currently Ongoing

## EXTRACURRICULARS & NON-TECHNICAL SKILLS

- **21<sup>st</sup>** in India in the **ACM-ICPC preliminary qualifiers** for onsite round, *2017*.
- **12<sup>th</sup>** and **13<sup>th</sup>** in **ACM-ICPC regionals** in Kanpur, and Gwalior respectively, *2017*.
- **1<sup>st</sup>** prize in **Autodesk Fusion 360 Challenge** in Uttar Pradesh, *2015*
- **2<sup>nd</sup>** position overall as well as in **Embedded** event in **4<sup>th</sup> Inter-IIT Tech Meet** representing **IIT Kanpur**
- **2<sup>nd</sup>** and **4<sup>th</sup>** position in **51<sup>st</sup>** and **52<sup>nd</sup> Inter-IIT Aquatics Meet** representing **IIT Kanpur** respectively
- Senior Marketing Executive in **Techkriti'16** and Company Coordinator for **Student Placement Office** in 2016-2017