Naman **Jain**

Final Year Undergraduate · Computer Science and Engineering

Indian Institute of Technology, Kanpur

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Educational Qualifications

Year	Degree	Institution(Board)	CGPA/%
2016-2020	B.Tech, CSE	Indian Institute of Technology, Kanpur	**9.4**/10.0
2016	Class – XII	Dyal Singh Public School, Karnal	97.6%
2014	Class – X	Dyal Singh Public School, Karnal	10/10

Scholastic Achievements

2016	**All India Rank 220,** Joint Entrance Exam Advanced, 200,000 candidates	*India*
2016	**All India Rank 36,** Joint Entrance Exam Mains, 1.3 million candidates	*India*
2016	**All India Rank 36,** KVPY Scholarship Awardee	*IISc, Bangalore*
2016	**National Top 1%,** National Standard Examination in Physics	*IAPT*
2016-18	**Academic Excellence Award,** For outstanding academic performance for three consecutive years	*IIT Kanpur*

Work Experience

Microsoft IDC (O365 Security and Compliance)

Hyderabad, India

Software Engineering Intern, Dr. Vasundhara Puttagunta

May. 2019 - July. 2019

- Worked on **Distributed Tracing** and its relevance in context of existing logging pipeline.
- Surveyed the current state of the art implementations namely, Dapper and Zipkin.
- Implemented a **wrapper around HTTP in nodeJ**S and a **C# library** following OpenTracing Standard, which supports asyncronous calls.
- E2E integration in Microsoft's internal module, with logs sent to pipeline and visualized through an UI along with performance impact testing.
- Reciprocated with **returning job offer** for noteworthy contribution to the team.

Tata Institute of Fundamental Research

Mumbai, India

Visiting Research Scholar, Prof. Rahul Vaze

May 2018 - July. 2018

- Worked on the problem of **Content Placement in Distributed Network** involving combinatorial optimization and integer programming.
- Analyzed various existing routing and caching strategies based on optimizing over fixed-paths.
- Modelled the problem to allow flexibility and came up with **2-approximation greedy solution**.
- Applied a learning algorithm(Projected Gradient Descent)to make it **distributed and adaptive**.
- Analyzed the problem of **max flow over time**; taking into account temporal component also.

New York Office, IIT Kanpur

Kanpur, India

Machine Learning Intern, Prof. Manindra Agrawal

July. 2018

- Worked on **Hashtag Recommender** based on extractive models like TF-IHU, MAUI, TextRank.
- Extracted key-phrases; spreadness and location features to be used in MAUI using nltk, rake libraries.
- Implemented comment-relevance and ordering feature using Glove model and wrote a **kafka pipeline using PyKafka**.
- Studied co-attention models for multi-modal hashtag recommendation.

Projects

Network and Load-aware Node Allocator for MPI Programs

IIT Kanpur

Prof. Preeti Malakar, Under-Graduate Project

July 2019 - November 2019

- Studied the problem of resource allocation for parallel MPI jobs in a shared system considering **network state** as well as **dynamic and static** resource attributes.
- Proposed and implemented allocation heuristic greedy algorithm by modelling the problem as sub-graph selection problem.
- Implemented a low intrusion monitoring system which gives current state of the system.
- Algorithm reduced execution times by **more than 40% on average** as compared to the MPICH default on MiniMD application.
- Short paper of our work was accepted in the **HiPC 2019 Student Research Symposium** for poster.

Secure Dropbox

IIT Kanpur

Prof. Pramod Subramanyan, Computer System Security

6th Semester

- Designed and implemented a **cryptographically authenticated, encrypted and secure file store** given an untrusted storage server and a trusted public key server.
- Authenticated user is allowed to store, retrieve, share and revoke an access to a file.
- Explored and used various cryptographic algorithms and entities like HMAC, Argon2, SHA256, Symmetric and Asymmetric encryption, etc..

Pike : GoLang Compiler *IIT Kanpur*

Prof. Amey Karkare, Compiler Design *6th Semester*

- Implemented a compiler for a **fully functional subset of Go programming language** in python from scratch.
- Implemented Lexical Analyzer using ply/yacc, Parser, Intermediate Code Generator and Assembly Generator.
- Incorporated advanced features like function overloading, multiple level pointers, auto type inference, structure assignment, etc.

Building GemOS *IIT Kanpur*

Prof. Debadatta Mishra, Operating System *5th Semester*

- Extended various functionalities of GemOS operating system.
- Implemented 4 level page table radix tree for new context and added various system calls, signal handlers and exception handlers.
- Implemented process scheduling and swapping, context creation for GemOS.
- Designed and implemented a filesystem at a single directory level using FUSE API.

Graph Representation Learning *IIT Kanpur*

Prof. Piyush Rai, Introduction to Machine Learning *5th Semester*

- Explored and analyzed various **graph embedding methods** namely **GraphSage, Node2Vec and GCN**.
- Comparative analysis of their performance on link prediction and clustering on Cora-Citation-Dataset.

Real Time Object Tracker *IIT Kanpur*

Prof. Vinay Namboodari, Visual Recognition *6th Semester*

- Performed unsupervised learning for real-time object detection and tracking on CCTV camera footage.
- Implemented and augmented detection algorithms - Sliding window approach with two layer detection.
- Evaluated **YOLO with SORT algorithm** and **Mask-RCNN** for real time tracking.

GoBikes: Platform for Rental Bikes *IIT Kanpur*

Prof. Arnab Bhattacharya, Database Management System *6th Semester*

- Created a **MEAN-stack web application** which provides platform for rental bikes.
- Simulated the real time bikes using **simulator written in GoLang** for testing purpose.
- Pipelined the bike data to **backend server written in NodeJS** via **REST calls** which manages allocation of nearest bikes.
- Authorized user can request for bike and the amount is deducted according to usage.

Wiki-Learn: Question Answering App *IIT Kanpur*

Microsoft code.fun.do *March 18*

- Implemented **Facebook DrQA** in the form of Question-Answering web-app; pre-trained on 13GB of **Wikipedia corpus**.
- Wrote the back-end for the app using flask library and integrated the model with the front-end; **deployed on Azure platform**.
- App delivers a best single line answer extracted from entire Wikipedia corpora and also the context it is extracted from.

Skills

Proficient C, C++, Python
Familiar C#, GoLang, NodeJS, Oz, Haskell, Assembly, Matlab
Utilities Linux shell utilities, Git, Docker, Visual Studio, Vim, GDB, MongoDB, MPICH, LaTeX
Libraries keras, tensorflow, numpy

Relevant Coursework

Algorithms Data Structures and Algorithms, Advanced Algorithms, Functional Programming, Fundamentals of Computing
Systems Parallel Computing, System Security, Operating Systems, Compiler Design, Computer Organization, Database Management
ML and Statistics Intro. to Machine Learning, Visual Recognition, Probability and Statistics
Theoretical Theory of Computation, Discrete Mathematics, Linear Algebra

Mentorship Experience

- **Teaching Assistant**, Dept. of CSE, IIT Kanpur July 2019 - Present
  Teaching assistant for the course ESC101, an introduction to programming fundamentals course mandatory for Freshers at IITK. The position entails helping students with problem solving, setting question papers and grading exam copies.

Miscellaneous

- Implemented Tetris Game on Arduino-based LED display table using concepts of mux-demux and coded Arduino.
- Developed Let's Chat android app in Microsoft's Code.Fun.Do
- Exploited and patched the Zoobar server as part of Computer Systems Security Course.
- Secured third place in Kho-Kho in Udghosh(Inter-Collegiate Sports Fest)
- NCC cadet for the year 2016-17 at IIT Kanpur