Deepesh **Lall**

Senior Undergraduate · Computer Science and Engineering

Indian Institute of Technology, Kanpur

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Educational Qualification

Year	Degree	Institution(Board)	CGPA/%
July'17 – June'21 (expected)	B.Tech, CSE	Indian Institute of Technology, Kanpur	8.5/10.0
2017	CBSE – XII	Delhi Public School, Bokaro Steel City (CBSE)	92.6%
2015	CBSE – X	Delhi Public School, Bokaro Steel City (CBSE)	10.0/10.0

Honors & Awards

2017	**All India Rank 795,** JEE Advanced 2017 (amongst 220,000 candidates)	*India*
2017	**All India Rank 3588,** JEE Main 2017 (amongst 1.4 million candidates)	*India*
2016	**All India Rank 203,** KVPY Scholarship SX (Conducted by IISC Bangalore) 2016	*Bangalore, India*
2016-17	**Among the top 1% ,** in National Standard Examination in Physics (NSEP) conducted by Indian Association of Physics Teachers (IAPT) 2016-17	*India*
2015-16	**Among the top 10%,** in National Standard Examination in Astronomy(NSEA) conducted by Indian Association of Physics Teachers (IAPT), and qualified for Indian National Astronomy Olympiad (INAO) 2015-16	*India*
2015-16	**Among the top 10% ,** in National Standard Examination in Physics(NSEP) conducted by Indian Association of Physics Teachers (IAPT) 2015-16.	*India*
2015	**Awardee,** Regional Mathematics Olympiad(RMO) 2015.	*India*

Work Experience

ADB-D Cloud Service Performance monitoring

India

Oracle — *May 2020 - June 2020*

- Used Linux /proc/ format report of cloud to extract metrics for performance monitoring like of CPU, Clusterware, Databases, I/O etc.
- Made a Metric generator with desired distribution with different possible Random distribution such as Gaussian, Laplacian and Expovariate etc over the base line along with manual override functionalities for Ideal Generation of metric distribution.
- Project was aimed to predict the system's performance metric Time Series Analysis and classifying the state of Cloud parameter as a regression problem over the normalized scale of 100%.
- Implemented this using ARIMA model and plotted the final result over the 20% extrapolated time scale along with the best model for the given metric for visual reference.
- Cross-Verified the Model performance over the Data set as provided and made optimizations like Auto-ARIMA for improving the results.
- Received a pre-placement offer based on performance.

Server Benchmark testing

IIT Kanpur

Supervisor Prof. Debadatta Mishra — *April 2019 - July 2019*

- Used apachejmeter benchmarking tool for server load and oltp benchmarking for database load testing.
- Confirmed the knee point in the graphical result of load on server in terms of latency time and throughput, with variation of number of users.
- Used Blazemeter and Apachejmeter for sending concurrent request from multiple threads recording the output sequence and benchmarking consecutively on a full-stack website hosted over localhost.

Research Experience

Social Distancing via Social Scheduling: A Game Theoretic Approach

IIT Kanpur, India

Co-Author — *August. 2020 - Present*

- Submitted the paper for the Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI-21) scheduled virtually February 2-9, 2021.
- Implemented Experiments and Simulation of the developed strongly polynomial Algorithms for Non-cooperative Slot Allocation using Integer linear Programming variant of the problem statement.
- Developed the VCG payment method for the payment in terms of time delay to the allocation algorithm to ensure truthfulness of the proposed strategy.
- Used Multi-threaded Models for solving ILP using open source software Gurobi and added Handlers to run large computation operation on high powered server with subjective multi-iteration normalization over the randomization of simulations.
- Showed that it reduces the social congestion significantly using users' visit data from a store and added Human Survey showing users' comprehension and acceptance of the algorithm in practice.
- Implemented a Flutter frontend Web app implementing the above algorithm with Gurobi as Allotment constraint Solver at backend.

Projects

JVC IC generator
github.com/DeepeshLall/Compiler-3ACgen

Prof. Swarnendu Biswas — *Jan 2020 - March 2020*

- Implemented a Multi-Level Symbol Table with Coercion,Implicit type castable Intermediate 3AC code(x86) generator for JAVA in a non-JVM env. with ANTLR4 as Computer based Language Recognizer and graphical AST.
- Used the ANTLR4 to parse code Lexically and Syntactically as per the Oracle's specified grammar and using its output to make Graphical format of AST.
- Made Parse Tree generator using Flex and Bison with JAVA8 Grammar.

gemOS *(C/Assembly)*
github.com/DeepeshLall/CS330-OS

Prof. Debadatta Mishra — *Aug 2019 - Nov 2019*

- Implemented and tested various operating system designs and optimizations on gemOS such as Process Context, Paging, Caching, Filesystem and Multithreading.
- Implemented pipes, multilevel page tables with lazy page allocation scheme, cfork and vfork for smart process creation.
- Implemented a multithreaded Hash Table with Open Addressing using mutual exclusion devices such as locks and semaphores for preventing concurrent access.

Market Factor Model
github.com/DeepeshLall/FF3FM-C4FM

Prof. Wasim Ahmad — *Jan 2020 - March 2020*

- Implemented the Fama French 3FM and extended it to momentum factor of Carhart 4FM using research paper mentioned as in repository for analyzing Market Models on Clean Energy Datasets using regression.
- Made Handlers for plotting the Efficient frontier and obtaining the minimum variance weights of multi-asset Portfolio.

Net. Packet Decoder
github.com/DeepeshLall/CRC-H74-Decode

Prof. Swaprava Nath — *Jan 2020 - March 2020*

- Implemented a decoder for changing the Binary Encoding of network Packet to ASCII and added the CRC checksum for Error Detection by listing the incorrect frame received.
- Added the Hamming(7,4) Decoder for Error detection & correction and predicting the maximum possible Error of the received Byte-packet.

Codefundo++
github.com/DeepeshLall/Disaster-Management

Microsoft Academic Accelerator — *October 2018*

- Built a full stack web application that predict the percent chance of thunder storm at particular location on the basis of few meteorological data.
- Got acquainted with the Microsoft Machine learning web services and used Azure Cloud to deploy the application.

SAT solver
github.com/DeepeshLall/Sudoku-solver

Prof. Subhajit Roy — *Nov 2018*

- Made a SAT solver using DPLL Algorithm and applied heuristics like Unit propagation to reduce the time taken to solve basic CNF using DIMAC file format.
- Implemented a simple Sudoku Solver & minimal Generator using MIT's Minisat SAT solver.

Positions of Responsibility

- **Mentor**, *Association for Computational Activities* :
  The student body of Department of Computer Science and Engineering, IIT Kanpur.
- **Student Guide**, *Counselling Service* :
  The student body of IIT Kanpur, guiding the new coming student during their first year.

Skills

Programming: C, C++, Haskell, Python, NodeJS
App Development: HTML, CSS, JavaScript, BootStrap, PHP, React, React-Native
Data Analysis: R, Graphviz, Pandas, Excel, MatplotLib, MATLAB, SQL, SQLITE
Tools: Git ,Bash, LaTeX, MIPS, GDB, Docker, REGEX, ANTLR4, Lex, Yacc, Bison , Autodesk Fusion360, Inventor, Gurobi
Cloud: Microsoft Azure, Oracle Cloud, AWS
Platforms: Windows,Ubuntu, Mac

Relevant Courses

Fundamentals of Computing	Discrete Mathematics	Computer Organization	Logic for Computer Science
Data Structures and Algorithms	Probability for Computer Science	Computing Lab - 1	Computing Lab - 2
Operating System	Theory of Computation	Introduction to ML	Algorithms - 2
Compiler Design	Database and Management	Computer Networks	Financial Econometrics
Applied Game Theory(i)	Game theory & mechanism design(i)	Bayesian Econometrics(i)	

i: In progress