Deepesh **Lall**

Senior Undergraduate · Computer Science and Engineering

Indian Institute of Technology, Kanpur

(+91) 911-338-4611 | deepeshsunny8@gmail.com | deepeshLall.github.io | DeepeshLall | deepesh-lall

Educational Qualification

Year	Degree	Institution(Board)	CGPA/%
July'17 – June'21 (expected)	B.Tech, CSE	Indian Institute of Technology, Kanpur	8.7/10.0
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.
- Predicted the system's performance metric using Time Series Analysis and classifying the state of Cloud parameter as a regression problem over the normalized scale of 100%.
- Modelled this using ARIMA 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 benchmarked 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*

- In proceeding with eighteenth European Conference on Multi-Agent Systems scheduled virtually June 28-29, 2021.
- Generated Simulation for the experimental analysis of the developed strongly polynomial Algorithms for Non-cooperative single demand Slot Allocation using Integer linear Programming for discerning the optimal.
- Reduced the multi-slot allocation problem to NP class of problems and analysed the expected reduction of problem to multi-unit combinatorial auction system.
- Optimized the truthful and voluntary participation of total allocation welfare for the multi-unit combinatorial auction system using a on-fly methodology of payment assignment.
- Compared the remodelled approximate solution to the optimal allocation and corresponding consolidation in the computational complexity.
- Reconciled 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.

Projects

Java 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 & make graphical format of AST.
- Composed 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 various operating system designs and optimizations such as Process Context, Paging, Caching, Filesystem and Multithreading.
- Modelled pipes, multilevel page tables with lazy page allocation scheme, cfork and vfork for smart process creation.
- Incorporated 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.
- Devised Handlers for plotting the Efficient frontier and obtaining the minimum variance weights of multi-asset Portfolio.
- Tested over the real world data-set of last 4-5 years from Yahoo stocks to get accurate results of multi-market model.

Bayesian Analysis
github.com/DeepeshLall/BayesianAnalysis

Prof. Mohammad Arshad Rahman — *Sept 2020 - Nov 2020*

- Devised linear Regression model, censored regression and truncated regression model with various prior and scalable data's likelihood to compute the posterior and covariate effect using Bayesian methodology.
- Discerned the posterior distribution for various cases using MCMC simulation and extend results to Metropolis Hasting algorithm and further compared its accuracy to Gibbs sampling for known proposed distributions.

SAT solver
github.com/DeepeshLall/Sudoku-solver

Prof. Subhajit Roy — *Nov 2018*

- Developed a SAT solver using DPLL Algorithm and applied heuristics like Unit propagation as optimization to solve basic CNF using DIMAC file format.
- Re-modelled a simple Sudoku Solver & minimal Generator using MIT's Minisat SAT solver.

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

Microsoft Academic Accelerator — *October 2018*

- Engineered full stack web application that predict the possibility of thunder storm at particular coordinate using meteorological metrics.
- Attained proficiency with the Microsoft Machine learning web services using Azure Cloud to deploy the application.

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.
- **Surveyor**, *National Service Scheme(NSS), IITK* :
  A platform for developing harmony with environment, education to the underprivileged section of society in the villages around IITK.

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	Financial Econometrics
Operating System	Theory of Computation	Introduction to ML	Advanced Algorithms
Compiler Design	Database and Management	Computer Networks	Bayesian Econometrics
Parallel Computing	Game theory & mechanism design	Advanced Econometrics	Macroeconomics