Ashi Veerman

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EDUCATION

Bachelor of Technology, Mathematics and Computing **(CGPA - 8.76/10)**
Indian Institute of Technology (IIT) Delhi, New Delhi, India (Sept 2021 - Present)

Class XII, CBSE **(Percentage - 98.2%)**
Maheshwari Public School, India (Jun 2021)

Class X, CBSE **(Percentage - 98.2%)**
Maheshwari Public School, India (Jun 2019)

SCHOLASTIC HONOURS AND ACHIEVEMENTS

IIT Delhi Endowment Merit Scholarship Awarded by Alumni Relations Office and Undergraduate Section (IIT Delhi) to recognise academic merit and consistency for three consecutive years. (2022,2023,2024)
Semester Merit Award Awarded by Undergraduate Section (IIT Delhi) to top 7% students in the institute based on semester GPA.
Joint Entrance Examination (JEE) Mains Secured an All India Rank (AIR) of 596 among 1.5 million candidates. (2021)
Joint Entrance Examination (JEE) Advanced Secured an AIR of 862 among 150,000 appearing candidates. (2021)
Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship Awarded by the Dept. of Science and Technology, Govt of India for securing an AIR of 379 in KVPY-SA and AIR of 1197 in KVPY-SX. Also offered admission to Indian Institute of Science (IISc) (2020, 2021)
State Science Talent Search Examination Secured state rank of 23 in exam conducted by the Board of Secondary Education. (2021)

RESEARCH INTERNSHIPS AND PROJECTS

On Device Generative AI - Adobe Research (May'24 - July'24)
Supervisor: Koyel Mukherjee, Soumyabrata Pal, Saud Iqbal, Adobe Research, Bangalore
- Worked on optimising latency and compute to enable LLM inferencing on edge devices in blackbox and whitebox settings.
- Did an extensive literature survey on state-of-the-art techniques including prompt compression, quantization, early exit, knowledge distillation, layer skipping, and lightweight models, focusing on optimization with least quality degradation.
- Devised heuristics based prompt compression technique in the blackbox setting, achieved 50% improvement in time to first token and 70% in compression latency with respect to LLM Lingua 2 with less than 5% degradation in quality.

Algorithm Design for Proctoring Software (Dec'22 - Feb'23)
Supervisor: Manu Gupta, Innokreat Technologies
- Designed and implemented an algorithm to compute credibility scores based on possible cheating practices.
- Simulated sample exam scenarios using Microsoft Power BI to check the working of the algorithm and to determine how the cred score data will be displayed to the instructor with timestamps where the cheating probability was maximum.
- Utilised cv2 and py-tesseract libraries for text detection testing to look for books and notes from test takers video.

Stochastic Games - B.Tech Project (Jan'25 -)
Supervisor: Vikas Vikram Singh, Department of Mathematics IIT Delhi
- Literature Review: Competitive Markov Decision Processes, Stochastic Games, Characterization of Stationary Nash Equilibria of Single Controller Constrained Stochastic Games

COURSE PROJECTS

Aspect Based Financial Sentiment Analysis (November 2024)
Barclays IB Quants Case Study Presentation
- Case involved performing Aspect Based Sentiment Analysis (ABSA) in the financial domain. Given a text instance, such as a microblog message, news statement, or headline, the goal is to: identify the target aspects from a predefined list of aspect classes and predict the sentiment score for each identified target aspect, expressed as -1 (negative), 0 (neutral) and 1 (positive).
- Finetuned BERT model on the dataset, good at handling polysemy and capturing long range dependencies.

Handwriting Recognition (Semester-I, 2024-25)
Course: Machine Learning, Prof. Tanmoy Chakraborty Project Repository
- Implemented a CNN+RNN model, which are effective at modeling sequential dependencies on Kaggle Handwritten names dataset.
- Utilised Connectionist Temporal Classification (CTC) loss function, the model is capable of learning to predict sequences in an end-to-end fashion without needing explicit supervision for each character's position in the input image.
- Evaluated model performance using Character Error Rate (CER) and Word Error Rate metrics (WER), the accuracy in predicting correct characters (88.67%) and words (74.93%) indicates that the model is capable of handling handwritten text with a reasonable accuracy.

ML Models from Scratch (Semester-I, 2024-25)
Course: Machine Learning, Prof. Tanmoy Chakraborty Project Repository
Implemented Linear Regression, Decision Trees, Random Forest, AdaBoost, Support Vector Machine and Transformer models from scratch, testing done on various datasets.

Image Classification (Semester-II, 2023-24)
Course: Data Mining, Prof. Bhawani Shankar Panda Project Repository
Implemented decision tree, random forest, naive bayes classifier, knn classifier and neural network classifier. Performed hyperparameter tuning through grid search and randomised search on MNIST Digit Classification dataset. Extended to facial recognition, by applying CNNs and advanced techniques like transfer learning and feature extraction.

Simulating Functioning of Operating System (Semester-I, 2024-25)
Course: Operating Systems, Prof. Ashutosh Rai Project Repository
Built a Unix-based shell from scratch using fork, exec functions. Simulated an OS by implementing offline and online scheduling policies (FIFO, Round Robin, SJF, MLFQ) for shell-based commands, and by writing custom memory management functions like malloc, calloc and free. Simulated producer-consumer and reader-writer locks using synchronization primitives.

Numerical Methods for Solving Differential Equations (Semester-I, 2024-25)
Course: Computational Methods for Differential Equations, Prof. VVK Srinivas Project Repository
Wrote MATLAB codes for implementing Lax-Wendroff, Lax-Freidrich, Godunov, Roe methods for solving PDEs. Implemented FTCS, BTCS and Crank-Nikolson methods for solving parabolic PDEs. Implemented Euler, Taylor series and Range-Kutta methods to solve ODEs. Implemented linear and non-linear shooting methods and linear and non-linear finite difference methods for solving BVPs.

Building a Computer from Scratch (Semester-I, 2023-24)
Course: Computer Architecture, Prof. Saurabh Gandhi Project Repository
Designing the Micro architecture for a SimpleRISC CPU using logisim-evolution software to perform arithmetic operations, load and store operations, branch instructions, call and return instructions. Replaced combinational circuit with a ROM based controller. Added support for input (keyboard) and output (display) devices by adding the control, data and status registers.

Optimal Integer Solution of ILP (Semester-II, 2022-23)
Course: Optimisation Methods and Applications, Prof. Minati De Project Repository
Implemented Two phase simplex and dual simplex algorithms to find solutions of linear programming problem. Implemented Gomory cut algorithm/Fractional dual algorithm to generate linear constraints to find the integer linear programming solutions of a maximisation problem which do not correspond to totally unimodular matrices (TUM).

RELEVANT COURSEWORK

Computer Science: Data Structures, Analysis and Design of Algorithms, Theory of Computation, Machine Learning, Data Mining, Computer Architecture, Operating Systems, Deep Learning for Natural Language Processing*, Computer Vision*, Computer Graphics*
Mathematics: Calculus, Discrete Mathematics, Probability and Stochastic Processes, Linear Algebra, Algebra, Optimisations Methods and Applications, Statistical Methods, Functional Analysis, Differential Equations, Numerical Methods and Computations, Real and Complex Analysis, Computational Methods for Differential Equations, Graph Theory, Mathematical Theory of Coding
Miscellaneous: CMU Advanced NLP**, CMU Multilingual NLP**, EfficientML.ai (by MIT Han Lab)**, Macroeconomics, Microeconomics, Econometrics, Financial Markets and Institutions, Signals and Systems, Digital Electronics
$*$ to be completed by May'25 $**$ online courses

EXPERIENCE

Intern, Innokreat Technologies (Dec 2022 - Feb 2023)
Research Intern, Adobe Research Bangalore (May - July 2024)
Software Engineer, Microsoft (July 2025 Joining)

TECHNICAL SKILLS

Python, C, C++, MySQL, LaTeX, NumPy, Pandas, Matplotlib, Scikit Learn, Pytorch, Tensorflow, MATLAB, nltk, spacy

MENTORSHIP AND OUTREACH

Student Mentor, Board of Student Welfare, IIT Delhi Engaged with a group of 6 first-year students to help them transition smoothly into college. Helped them understand course-based requirements and cleared doubts pertaining to various activities on campus.
Academic Mentor, Board of Student Welfare, IIT Delhi Mentored first-year undergraduate students from Himadri and Kailash hostels in the MCP100 course, conducted offline weekly doubt-clearing and question-solving sessions.
Teaching Volunteer, Project VIDYA, NSS, IIT Delhi Volunteered to teach Science and Mathematics to high-school students from underprivileged economic background. Mentored these students to help them prepare for the standard examinations post high school.
JEE Question Bank Creation Volunteer, Project Aarohan, NSS, IIT Delhi Volunteered to create a topic-wise question bank with solutions (in English and Hindi) of Mathematics for students preparing for JEE Mains and Advanced.

EXTRA-CURRICULARS

Member, ARIES, IIT Delhi Taken part in research discussions conducted by Artificial Intelligence Society, IIT Delhi.
Member, MathSoc, IIT Delhi Conducted events of Mathematics Society including Integration Bee, Mematics, Da Vinci Curves.
FACC (Fine Arts and Crafts Club) Azure, IIT Delhi Best Azure Member (BRCA Awards'22), Artist of the Summer (BRCA Awards'22), Inter IIT Contingent Member (2022), Best Club (BRCA Awards'2022), Runner Up FACC Trophy(2022)
Decoration Coordinator, RendezvousX, IIT Delhi Managed the decoration vertical of Rendezvous (cultural fest of IIT Delhi)