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Examination	University	Institute	Year	CPI/%
Graduation	IIT Bombay	IIT Bombay	2028	9.68/10
Intermediate	TSBIE	Sri Chaitanya Junior Kalasala	2024	97.2%
Matriculation	BSEAP	Sri Viswa Shanthi High School	2021	100%

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 10** in the **IIT Joint Entrance Examination Advanced** among 2 lakh candidates (2024)
- Secured **5th rank** at IITB and **35th rank** globally in the **Simon Marais Mathematics Competition** (2025)
- Honoured with the **Institute Academic Award** for achieving **Department Rank 15** (2025)
- Awarded prestigious **Reliance Foundation Merit Scholarship** for outstanding undergraduate studies (2024)
- Selected for the highly competitive **Jane Street SEE (Student Exploration Event)** program (2025)
- Achieved **State-wide Rank 12** in **AP EAMCET Exam 2024** out of **280,000+** candidates state-wide (2024)

OLYMPIADS

- Among the top 35 students in India to clear the **Indian National Physics Olympiad (INPhO)** and invited twice to attend the **Orientation-Cum-Selection Camp for International Physics Olympiad(IPhO)** (2023,24)
- Awarded **Gold Medal** at **Orientation-Cum-Selection-Camp(OCSC)** for International Physics Olympiad (2023)
- Ranked among **Top 29** participants nationwide in **INAO** and was invited to **Astronomy OCSC** for IOAA (2024)
- Secured **All India Rank 4** in the **International Earth Science Olympiad (IESO)** in 8-th grade (2020)
- Awarded the prestigious **Kishore Vaigyanik Protsahan Yojana (KVPY)** Fellowship in 2021–2022 (2022)
- Qualified at the **state level** for the National Standard Examination **NSEJS, NSEB, NSEC** (2021,22,24)

RESEARCH EXPERIENCE

Using Lean to Teach Proof Writing (SUAMI) | Carnegie Mellon University (May - July 2025)
Guide: Prof. Pavel Kovalev

- Developed an **interactive Lean 4 game** using the Lean4 Game Engine, modeled after the early chapters of An Infinite Descent into Pure Mathematics-Clive Newstead, allowing players to improve their **formal reasoning skills**
- Project serves as an optional study supplement to guide students through proof techniques, with gradually reduced assistance as skills improve; suitable for self-study and **under consideration by CMU** for integration into courses
- Implemented lightweight **custom tactics** in Lean emulating textbook strategies such as contradiction, contrapositive, introduction and elimination rules allowing beginners to **focus on ideas** rather than Lean syntax in the game

Exploring the Kinematics and Substructure of M31 & M32 (SIP) | UCSC (May - July 2024)
Guide: Prof. Raja GuhaThakurta, Rohit Raj

- Used data analysis libraries (NumPy/Pandas/Astropy) to process **SPLASH (Keck/DEIMOS)** and **DESI** survey data of **M31 (Andromeda)** and its satellite **M32**, designing methods to reduce noise caused by stellar clustering
- Evaluated **calibration accuracy** by comparing DESI data with the **HST-based stellar catalog**—the most precise in that region—and used it as a guide to ensure consistency across different instruments and regions of M31
- Built a comparison pipeline to conduct comparison of SPLASH and DESI measurements of velocity and intensity, aimed at understanding **M31 and M32** in the broader context of **investigating the kinematics and substructures**

PUBLICATIONS

Solving the N-Queens Problem Using Simulated Annealing | [link] (2024)

- Published research presenting a novel hybrid algorithm combining **simulated annealing** with **genetic operators** to solve the classical **N-Queens problem**, providing a unique optimization perspective in algorithmic development
- Demonstrated improved performance over classical backtracking by applying probabilistic and evolutionary methods to minimize conflicts efficiently while solving N-Queens, ensuring scalability and efficiency of the solutions
- Applied initialization, iterative annealing, and fitness-based selection for scalable higher-order N-Queens solutions

KEY PROJECTS

Distributed Algorithms Simulation Project | IIT Indore (Dec 2025)
Guide: Prof. Debasish Pattanayak

- Extended an existing **distributed-algorithm simulator** (based on the CCM Model) by implementing a new algorithm for **coordinated distribution of k agents across a graph**, where agents operate independently
- Designed, evaluated and compared multiple algorithmic strategies for agent placement, comparing their **efficiency, robustness, and convergence properties** through large-scale simulation experiments on diverse graphs
- Built modular simulation components enabling rapid prototyping of additional distributed protocols, supporting **visualization, instrumentation, and reproducible analysis** of algorithmic behavior on arbitrary graphs

Chess Engine with Classical Game Theory +NNUE | Seasons of Code (May - July 2025)

- Developed a chess engine with chess library in C++ to represent board fen and performed **Min-max search with Alpha-Beta pruning**, using a handcrafted 5-parameter evaluation (material, position, mobility, promotion, danger)
- Trained a **NNUE (Efficiently Updatable Neural Network)** model (100k+ parameters) on extensive board-value data from Stockfish, enabling significantly more accurate position evaluation compared to the 5-parameter estimation
- Integrated **NNUE with iterative deepening search**, Zobrist hashing and transposition tables, combining evaluation, pruning, efficient memory use and faster updates to reliably compute optimal moves via deep self-play
- Achieved a rating of 1700, demonstrating strong competitive play and consistent performance against skilled opponents

Facial Recognition System | Winter in Data Science (December 2024)

- Built a **facial recognition system** with 97% accuracy using TensorFlow for deep learning and OpenCV for efficient real-time image capturing, GPU-accelerated pre-processing, optimized feature extraction, and latency reduction
- Performed **HOG-based detection**, extracted 128D embeddings and applied **distance-weighted k-NN**, combined with pre-processing (grayscale, resizing, normalization), PCA and evaluation on labeled datasets for accuracy
- Implemented **data augmentation**, **transfer learning** and **modular reusable code with exception handling and detailed logging** to reduce overfitting and ensure scalability and system reliability in face recognition

Multiplayer Angry Birds | Course Project: Software Systems Lab (2025)

Guide: Prof. Kameswari Chebrolu

- Built a two-player, turn-based **Angry Birds-style game** in Python using **pygame-ce** and **NumPy** and structured into modular components for birds, blocks, fortress, wind dynamics, environment settings and player history data
- Implemented **Newtonian physics** (projectile motion, gravity, restitution) with accurate collision detection, multiplayer state management, unique **special-ability projectiles** and smooth random wind noise via fractals
- Added a **theme selector** supporting distinct backgrounds, wind speed and ground levels, with context-aware sound effects, wind simulation, adaptive gravity and background music for enhanced variety and gameplay immersion

OTHER PROJECTS

Circuit Synthesis Using SAT Solver | Course Project: Logic (August 2025)

Guide: Prof. Krishna S

- Built a SAT-solver based framework to automatically **synthesize NAND-only circuits** from arbitrary Boolean formulae/ truth tables while **minimizing the number of gates** through iterative deepening on number of gates
- Implemented in **Python** with PySAT, encoded input formulas into truth tables and applied NAND logic to generate valid NAND connections with constraints for input encoding, gate count, logic semantics and output constraints

Assorted Projects | Self Projects (2023-2025)

- Built a SAT solver in c++ using DPLL/CDCL with clause learning, intelligent backtracking, and efficient heuristics
- Built a **number recognition system** entirely in **NumPy**, implementing forward/backward propagation and the **Adam optimizer**, without any external ML libraries to train and evaluate a small neural network from scratch
- Developed a **Rubik's Cube solver** in Python using the IDA* algorithm with a 54-element state, misplacement-based heuristic, move-cycle tables, pruning of inverse/duplicate states and depth-bounded search for efficient solutions
- Implemented a **Sudoku solver** using recursive backtracking with constraint checks and logging for real-time steps
- Designed a **spell-checker** with a Trie-based dictionary, enhanced **Levenshtein distance** using keyboard proximity and frequency-weighted ranking for accurate, context-aware auto-correction and word auto-complete suggestions
- Built a **MCMC** tool for decrypting basic substitution encryption and evaluating performance on noisy text data
- Built a lightweight **web server** to share personal messages and status updates, storing them in simple text files

TEST SCORES

Year	Exam	Score/Grade
2024	Cambridge Further Mathematics (AS/A Level)	Grade 'A'
2023	Oxford MAT	92/100
2023	STEP II and III (Cambridge)	'S' (Outstanding)
2023	TMUA (Cambridge)	9/9
2023-24	College Board APs (Calc BC, Physics 1, Physics C: Mech & E&M, Chem)	5/5; AP Scholar with Distinction
2025	SAT	1510/1600

TECHNICAL SKILLS

Languages	C++, Python, Javascript, Bash, MATLAB, Assembly, Verilog, Make, HTML, IAT _E X
Data Science	NumPy, Pandas, Matplotlib, PyTorch, SK-Learn, Tensorflow
Tools/Softwares	Git, Github, Sed, Awk, Jupyter, Fusion360, Fractory, LaserCAD

EXTRACURRICULAR ACTIVITIES

- Achieved **fourth place** in **Tyro CTF Competition** (IIT Bombay) (2024)
- Participated in the **NSO athletics** training program, developing discipline, endurance and teamwork skills (2025)
- Awarded full scholarship by **Sri Chaitanya School**, with stipend support to join advanced training (2024)
- Trained under-resourced students** in Mathematics and Science for 2 years, improving local literacy (2020-2024)
- Taught Yoga and Meditation to local community kids, promoting health, mindfulness and awareness (2020-2024)