



GHOSAL SUBHOJIT



ACADEMIC DETAILS

| Year | Degree / Board | Institute | GPA / Marks(%) |
|------|--|--------------------------------------|----------------|
| --- | B.Tech and M.Tech in Mathematics & Computing | Indian Institute of Technology Delhi | 9.12 |
| 2022 | Maharashtra | St. Paul Jr College | 92.67% |
| 2020 | CBSE | Kendriya Vidyalaya | 94% |

SCHOLASTIC ACHIEVEMENTS

- **IIT Delhi Merit Prize Award** 2023, 2022 for being in **top 7%** in sem 2 and sem 3, **Department rank 3** at end of semester 6
- **Regional Mathematics Olympiad (RMO)**, 2019-20, securing among **top 30 candidates** all over India KVS
- **Indian National Mathematical Olympiad (INMOTC)** 10 days Training Camp attended at IIT Madras, 2019-20
- **Indian Olympiad Qualifier in Physics (NSEP)** - Merit, 2021-22, awarded as **State Topper** of Maharashtra
- **National Standard Examination in Junior Science (NSEJS)** - Merit, 2018-19, among **top 40 candidates** all over Maharashtra
- **All India Rank 720** in JEE-Mains, 2022 from among **more than 1,100,000 candidates** from all over the country
- **Kishore Vaigyanik Protsahan Yojana (KVPY)** Scholar 2 times, securing **All India Rank 503** over 100,000 candidate
- Secured **All India Rank 25** in IAT(IISER Aptitude Test) and **All India Rank 5** in NEST(National Entrance Screening Test)

TECHNICAL SKILLS

- Actively participated in **Codeforces** contests, highest rated **1660 Expert on Codeforces**, & **1900+ on CodeChef**
- **Language/Software/Libraries:** C++, Python, MATLAB, LaTeX, NumPy, Pandas, Scikit-Learn, Pytorch, Verilog, Autodesk

PROJECTS

- **Research Project: Stateless Model Checking of Concurrent Systems** - Prof. Subodh Sharma (Jan'25- Ongoing)
 - Studied Dynamic Partial Order Reduction-**DPOR** Algorithm to mitigate the **NP-hard combinatorial explosion problem** in thread interleavings by reducing the explored state space w.r.t. safety properties, enabling efficient verification.
 - Reduced time complexity from **$O(m^r)$** (naïve interleaving) to **$O(C \cdot \text{poly}(n))$** , C is no. of equivalence classes.
 - Currently developing **view-equivalence**, novel and coarser, than Mazurkiewicz equivalence class used in DPOR.
- **Research Project: Friend Recommendation in Social Networks** - Prof. Sandeep Kumar (Feb'25 - May'25)
 - Studied and implemented GraFRank, a **multi modal** Graph Neural Network over profile, engagement, friending and link features, for friend ranking, featuring **modality specific neighbor aggregation** and **cross modality attention**.
 - Tested against **GraphSAGE** and other models, on **Facebook SNAP** dataset, achieving **30% uplift in MRR & HitRate@50**
- **Bipartite Graph Attention Network for Personality Prediction** - Prof. Sayan Ranu (March'25)
 - Modeled data as a user-product **bipartite graph** and designed a graph attention architecture to incorporate the bipartite nature.
 - Leveraged **residual connections and LayerNorm** to aggregated multi hop neighbor features for stable deep message passing.
 - Secured 1st rank in class with **97% F1 Score**, outperforming standard vanilla GNNs, GCNs & GraphSAGE (70-80% F1)
- **Influence Maximization in Social Network** - Prof. Sayan Ranu (March'25)
 - Solved the NP hard influence maximization problem with **CELF++**, under the IC model, achieving the **63% spread guarantee**.
 - Reduced complexity from $O(NkR)$ to **$O(k \log N + nR)$** using **lazy forward updates** achieving **100x speedups** on 1M node graphs.
- **Research Project: LRS Strategy in Global Markets** - Prof. Vipul Goyal (CMU) (Dec'24 - Jan'25)
 - Studied and implemented **Leverage Rotation Strategy (LRS)**, backtested on Indian, US, Japanese and European Markets.
 - Built a robust backtesting engine and found that a 2x LRS delivered a 19.0% annual return with 24.9% volatility and -78.7% max drawdown, outperforming static 2x leverage (14.3% return, 37.8% volatility, -98.8% drawdown)
- **Expression Evaluator and Compiler w/o Overflow Limitations in C++** - Prof. Rahul Garg (Nov' 23)
 - Computes expressions provided as a remote language E++ generating machine understandable code for a stack machine.
 - Provided **history feature with $\log(N)$ access time** storing the addresses of the calculated variables in an **AVL Tree**.
 - Created a class for integers and rational numbers of **length up to 10^5** and implemented all accurate arithmetic operations.
 - Achieved time complexity of **$O(L^{1.59})$** for multiplication of two unlimited integer using **Karatsuba's Algorithm**.

EXTRA CURRICULAR ACTIVITIES

- Winner at **QRT Quant Quest - Data Challenge** among 200+ teams, made an Alpha with 3.9 Sharpe ratio.
- Qualified for Nationals and achieved Gold level in the **WorldQuant** - International Quant Championship.
- Top-10 rank in **Mathemania - IIT Kanpur**, an inter-IIT non-routine mathematics contest with 200+ participating teams.
- Completed five days long **National Cadet Corps (NCC)** winter camp at 3DBN NCC Battalion Delhi.