Anirudha Kulkarni

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ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
2019 - 24	B.Tech and M.Tech in Computer Science & Engineering	Indian Institute of Technology Delhi	8.98
2019	C.B.S.E.	J N V Kottayam	97.40
2017	C.B.S.E.	J N V Latur	10

SCHOLASTIC ACHIEVEMENTS

- **WorldQuant Brain Global Alphathon**: Team secured **26th rank** among 12,800 teams worldwide in stage-I *(2022)*
- **Jane Street ETC 2022**: Last hour **Winner** and overall **All India Rank (AIR) 3** at Electronic Trading Challenge *(2022)*
- **ACM ICPC Regionals 2020:** Achieved **AIR 95** at International Collegiate Programming Contest Asia Regionals *(2021)*
- **Summer Research Fellowship**: Awarded Research **Fellowship** by Indian Academy of Sciences, Bangalore *(2021)*
- **IIT Delhi Semester Merit Award:** Conferred for ranking among **Top 7%** students in the batch with **10/10** GPA *(2020)*
- **Samsung Star Scholarship**: Among **Top 5** students in institute to receive scholarship for academic excellence *(2020)*
- **Olympiads**: Ranked in National **Top 1%** in NSEP (Physics), NSEC (Chemistry) & NSEA (Astronomy) Olympiads *(2019)*
- **Kishore Vaigyanik Protsahan Yojana**: Awarded **Fellowship** by Ministry of Science & Technology ranked **343th** *(2019)*

INTERNSHIPS

- **Optiver, Amsterdam** | *Software Engineering Internship* *(May'23 - Jun'23)*
  - Designed Network parser for sifted captures, achieving **88%** & **92%** reduction in **time** & **space** utilization respectively
  - Developed high-performance **LZ4** library, enabling **6% faster** processing. Led to system wide adaption of LZ4 format
  - Proposed & revised the multithread model to read from disk and parse network packets from **O(N)** to **O(1)** CPU usage
- **Mosaic Research Capital, Australia** | *Quantitative Developer Remote Internship* *(Dec'21 - Jan'22)*
  - Developed end-to-end **Infra** for trading Non-Fungible Tokens on Ethereum via OpenSea & captured trade opportunities
  - Utilized OpenSea, bloXroute APIs, IPFS node & RedisDB to fetch market data with **50%** reduced time than paid service
  - Generated **10x-40x** gains by creating strategies based on rarity & **statistical arbitrage** to capture information asymmetry
- **National Blockchain Project, IIT Kanpur** | *Blockchain Research Internship* *(May'21 - July'21)*
  - Developed decentralized scheme for consent management and PoC on **Quorum** nodes using **web3js**, jquery, bootstrap
  - Conducted market research on optimal parameters with trade-off between **privacy** & production feasibility of use cases

PROJECTS

- **Live Snapshot of Linux and De-duplication** | *Rust, cloud computing* *(Sep'22 – Nov'22)*
  - Implemented **Live snapshot** of general Linux machine on rust VMM by saving-restoring vCPUs, memory & device states
  - Developed & published de-deduplication crate to store memory efficiently to enable page sharing resulting **91**% reduction
  - Lead a team of 5 to deliver VM forking & **live migration** of multiple Linux VMs with less than 100ms delay to end-user
- **Joint Refinement and Calibration in DNNs** | *PyTorch, Probability* *(May'22 - Jul'22)*
  - Identified the root cause for **miscalibration** and lack of **refinement** in classification with Deep Neural Networks (DNNs)
  - Improved state-of-the-art refinement in DNNs by improving **AUROC by 10%** & reducing **ECE by 5x** with a new loss
- **Noisy Embedded Text Extraction & ML Library** | *Numpy, PyTorch* *(Sep'21 - Nov'21)*
  - Noisy Text Extraction: Defined architecture to extract image features with **CNN** encoder + word-level **LSTM** as decoder
  - Implemented Naïve Bayes, LR, GDA, SVM, Decision Tree, Random Forest, Deep Neural Network & K-means in numpy
- **Basic Operating System Kernel** | *C, x86 assembly* *(Feb'22 - Mar'22)*
  - Developed custom OS in C & x86 assembly with **multicore** functionality & shell interface to perform mathematical tasks
  - Implemented **Drivers**, stackless **Coroutines**, **Fibre**, Non-Preemptive, Preemptive scheduling & multicore **consistency**
- **Template Search in Image** | *CUDA* *(Feb'22 - Mar'22)*
  - Implemented an algorithm to determine the positions of potentially rotated query image on the input image concurrently
  - Parallelized algorithm with CUDA, utilized **bilinear interpolation** to compute rotated coordinates, and **RMSD** for error
- **DRAM request manager for multi-core MIPS simulator** | *C++* *(Mar'21 - May'21)*
  - Simulated a Multi-Core Processor supporting a subset of **MIPS** instructions in C++ and non-blocking memory algorithm
  - Added support for forwarding & DRAM wait **buffer re-ordering** to reduce fetch time of instructions from main memory

TECHNICAL SKILLS

- **Languages:** C, C++, Python, Java, CUDA, PostgreSQL, VHDL, Bash, TypeScript, Solidity, ML-Lex, JavaScript, MatLab
- **Tools**/Libraries: PyTorch, OpenMP, MPI, web3js, ethers, Boost, OpenCV, SDL, socket, TensorFlow, NetworkX, ChatGPT

POSITIONS OF RESPONSIBILITY

- **Teaching Assistantship**: Provided instructional support for **COL215**, **COL215P**, **COP290** and **COL106** courses (2023)
- **Technical Co-ordinator, eDC**: Managed **10+** executives for tech vertical of club to handle website & business conclave