**Naresh Balamurugan**                  190110051

**Metallurgical Engineering and Materials Science**    B.Tech.

**Indian Institute of Technology Bombay**       Gender: Male

DOB: 6/15/2000

| Examination | University | Institute | Year | CPI / % |
|---|---|---|---|---|
| Graduation | IIT Bombay | IIT Bombay | 2023 | |
| Intermediate | CBSE | Vagad Pace Global School | 2018 | 93.00% |
| Matriculation | CBSE | Don Bosco Senior Secondary School | 2016 | 10 |

Pursuing Minor degree at the **Centre for Machine Intelligence and Data Science**, IIT Bombay

## SCHOLASTIC ACHIEVEMENTS

- Received the International **FIS Scholarship Program** worth 3000 USD for top **300** students worldwide    *('19)*
- Secured **98.24** percentile in JEE Advanced among top 173,000 candidates in India    *('19)*
- Secured **99.67** percentile in JEE Mains among 1.21 million candidates all over the country    *('18)*
- Recipient of the prestigious **Ramanujan Scholarship** and Gold Medal in JMO conducted by IME    *('12)*
- Achieved a State rank - **3** and National rank - **20** in National Cyber Olympiad supervised by SOF    *('14)*

## PROFESSIONAL EXPERIENCE

**Quant Strategist Intern |** *Alpha Alternatives Holdings LLP*    *(May'21-Jul'21)*

*Received a **Letter of Recommendation** from the **Head** of Quant Business*

- Overhauled the development of financial results strategy and engulfed direction using options **OI** with **1.3** sharpe
- Assessed Minimum variance portfolio and subsumed shrinkage covariance matrix for **3** Indian tickers in NSE500
- Executed the code of collecting live bid-ask data using XTS **API** and optimized by reducing disk usage by over **70%**
- Researched on the IV **term structure** of options to obtain information on **IV** rise solely due to result declaration

**Algorithmic Trading Intern |** *SMC Global Securities Limited*    *(Dec'20 – Jan'21)*

- Modelled a functional python-based Options **Back-testing** Model feeding valuable insights on past performance
- Devised a back-test on multiple confirmation to generate **signals** in sector index using top **4** weighted stocks
- Optimized the strategy based on **volatility** and developed an Algorithmic trader for automated weekly execution

## POSITIONS OF RESPONSIBILITY

**Core Team Member |** *Student Alumni Relations Cell, IIT Bombay*    *(May'21-Present)*

*Leading Design Portfolio; Part of **11** core team members to foster professional relations between **60k+** Alumni and the Institute*

- Chairing a team of **4 Design Coordinators** to supplement the association working in coherence with Dean ACR
- Assisting in aggressive expansion of SARC's social envelope to capture platforms like Facebook, LinkedIn and Twitter by creating visual content for publicity of various events and initiatives, with a budget of **INR 1.2M**
- Ideated and facilitated theme-based publicity of Annual Phonathon generating a **50%** y-o-y rise in volunteers

**Sector Head |** *Institute Investment Team*    *(May'21 – Present)*

*Orchestrating a team of **21** enthusiastic students focused in finance and investment with a vision to create student run fund*

- Delivering actionable insights from analysis of **5** sectors supported by Technical and Fundamental analysis
- Gaining Industry exposure on Indian financial markets in the form of professional training from **Zerodha**
- Co-ideated a revamped **3-tier** hierarchy team structure to ensure efficient management of the team's fund

**Design Convener |** *Institute Technical Council*    *(Jun'20 – Apr'21)*

*Part of a **2**-member team responsible for publicity of technical activities catering to students on campus*

- Ideating and executing the publicity of **11+** technical clubs to increase contribution towards Technology
- Delivered quality content creation in the form of videos and posters on social media with **10k+** campus audience
- Assisted the social media campaign with an astounding reach of **20k+** highest ever on our Facebook page

**FinSearch Mentor |** *Finance Club, IIT Bombay*    *(Jun'21 – Jul'21)*

*Integral part of the **7**-membered team to head individual finance research topics catering to all students of the institute*

- Mentored **5** teams consisting **15** students focusing on research of 'Machine Learning and Stock Price Movement'
- Guided the teams periodically for providing insights on various research papers and comprehend applications

## KEY PROJECTS

**Neutral Ratio Spread Strategy |***Self-Project*                                          *(Jun'20 – Nov'20)*

- Engineered a **quantitative** weekly trading strategy using bank-nifty derivatives generating **42%** annualized ROI
- Back-tested for combinations of holding period for a **1-year** duration and analyzed the condition of best returns
- Optimized the strategy to suppress maximum drawdown to **2%** of initial capital and retain risk-reward ratio

**Machine Learning in Technical Analysis |** *Guide: Prof. Piyush Pandey*                 *(Aug'20 – Nov'20)*

- Researching on various methods of **Machine Learning** that enhance returns through Technical Analysis
- Training an **LSTM** recurrent neural network to predict future stock prices from patterns in historical data

**Autonomous Poker Dealer |** *Institute Technical Summer Project*                         *(Mar'20 - Jul'20)*

- Designed and simulated an **integrated bot** capable of shuffling and dealing cards identical to real poker dealers
- Embedded motor driven **robotic arm** and lead screw mechanism to facilitate interactive card dealing to **8** players
- Developed a **PCB** design on Eagle software and an Arduino code to systematically control bot's motor function

**Comparative Study between ML and DL Algorithms |** *Course Project | Guide: Prof. Biplab Banerjee*  *(Apr'21 - May'21)*

- Classified handwritten digits using multiple machine learning and deep learning algorithms using the MNIST database with a **10k+** test sample space, algorithms involved include neural networks, **CNNs**, SVMs
- Presented a comparative analysis of the training time and **accuracy** of each algorithm in a systematic report
- Achieved an average prediction accuracy of **96.2%** and a minimum training time per epoch of **6** seconds

**Purified Silver Nano-particle Powder Synthesis |** *Course Project | Guide: Prof. Parag Bhargava*   *(Apr'21 - May'21)*

- Researched extensively on nanoparticles and their synthesis whose structural range lies between **1-10 nm**
- Analysed cardinal relations between **AgNPs** production and ancient Ayurveda process in biomedical applications
- Reported the conversion from to powder form using polystyrene **ultrafiltration** membrane and **spray-drying**

## TECHNICAL SKILLS

**Languages:** Python | C++ | C | R | MATLAB

**Softwares:** AutoCAD | Solidworks | Photoshop | Premiere Pro | Eagle | After Effects | Illustrator | Anaconda

**Data Science and ML:** Pandas | NumPy | Matplotlib | Seaborn | Scikit-Learn | Keras | Jupyter Notebook

| **Key Courses Undertaken** | Introduction to Machine Learning | Data Analysis and Interpretation | Programming for Data Science* <br> Computer Programming and Utilization | Linear algebra | Introduction to Numerical Analysis |
|---|---|

*\* To be completed by Nov'21*

## EXTRACURRICULARS

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|---|---|
| **Trading** | • Managing portfolio worth **INR 1.2M** using options strategies and positional strategies in equities <br> • Pursued **'Equity Portfolio Management'** course offered by Alphabeta and NSE Academy <br> • Proactively use pivot analysis, OI analysis, EMAs, **price action** to trade in Indian financial markets |
| **Sports** | • Received **Silver Medal** for football in Sportsfete, NIT Trichy among **10** different departments <br> • Endowed with **Gold Medals** for rapid chess and football in annual department sports day <br> • **Semi-finalist** in Inter hostel football General Championship amidst **10+** competing hostels |
| **Music** | • Recipient of Level 2 **certificate** in practical Graded Examination in music performance for Electronic Keyboard **Grade 5** by **Trinity College London** which grants 18 credits at Level 2 QCF |
| **Abacus** | • Attained International standard **Ordinary** Grade **4** certification by Chinese Zhusuan Association <br> • Awarded **champion** in State and **runner-up 5** in National Abacus and Arithmetic competition <br> • Honored by **Post Graduation** in UCMAS Abacus academy for completion of all Grand Levels |
| **Others** | • Accorded **runner-up 1** in National Handwriting Olympiad and rewarded with cash prize **INR 25k** <br> • Bestowed with **Best Dramatic Video** in Silver Edit competition among 9 participating IIT's <br> • Committed for environmental welfare in **'Zero Plastic Waste'** movement in IIT-B Half Marathon <br> • Finished **2nd** and **3rd** in consecutive years in annual Mumbai Rotary Club Quiz among **20+** schools |