Kalash Setu Shah 200100079
Mechanical Engineering B.Tech.
Indian Institute of Technology Bombay Gender: Male
DOB: 11/6/2002

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	
Intermediate	CBSE	DAV Public School Pune	2020	95.60%
Matriculation	CBSE	DAV Public School Pune	2018	98.20%

Pursuing Dual Minors in **Computer Science** & **Machine Intelligence** & **Data Science** with a **10.0** CPI

SCHOLASTIC ACHIEVEMENTS

- Holding **Department Rank 9** among a batch of **195+** students based on academic excellence (Present)
- Achieved an All India Rank of **660** in JEE Main, out of more than **1 million** candidates globally (2020)
- Secured an All India Rank of **744** in JEE Advanced, out of more than **0.25 million** aspirants (2020)
- Received the **KVPY** Scholarship with AIR **299** from the Ministry of Science & Technology, India (2020)
- Qualified for **INChO**, among the top **1%** from over **50,000** candidates appearing for **NSEC** (2019)
- Awarded the **Certificate of Excellence** for being the **national topper** in Social Science in class X (2018)
- Awarded the **Silver Medal** for being the **State topper** in the second round of 9th SOF **IMO** (2016)

INTERNSHIPS

Computational Social Theory (May'22 - Present)
Tata Institute of Fundamental Research | Guide: Prof. Umang Bhaskar

- Reviewed literature on Pure Strategy **Nash Equilibrium** and **Efficient Allocation** of indivisible resources
- Analysed **Modified Round-Robin** and **Envy-Cyle Elimination** Algorithms for **EF1** allocation of items
- Currently working on **developing** an algorithm for **EF1** allocation of **non-monotone concave** valuations

Algorithmic Trading in the Global Commodities Market (Dec'21 - Jan'22)
Quantitative Analyst Intern | Research and Development team | Stellar Alpha

- Encoded a model in **C#** using a grid of optimised **indicators** and **test strategy** to generate **alpha**
- Organised and resampled the stock data of over **50** global commodities into **60 seconds-OHLCV** segments reducing the original data suitable for backtesting by **1000** times, via sorting methods in Python
- Performed a **Backtest** to find out the best combination of variables amongst the **4320** possible permutations of the optimization table and generated a **113.5%** profit on the principal over a **year-long** data

KEY PROJECTS

Computational Analysis for Climate Resilient Agriculture (Jun'22 - Present)
In collaboration with Google Climate Engine | Guide: Prof. Milind Sohoni

- Performed extensive **spatial analysis** of agricultural data and **derived statistical measures** using QGIS
- Implemented **Gradient Ascent** algorithm to correct the mismatch of Google Farmplots and MRSAC cadastres, and improved the intersection area by over **8%**, thereby leading to better **field segmentation**
- Encoded a **Polygon-BFS** algorithm in Python to generate a **super-polygon** cover for adjacent farmplots

Machine Learning for Covid-19 Data Analysis | *DS-203 Course Project* (Nov'21)

- Analysed the global covid data to **predict** the number of deaths and **hospitalization probability**
- Performed thorough **exploratory data analysis** and **hypothesis testing** to derive variable correlations
- Compared **four** regression algorithms to predict the **number of deaths** with the best **R2-score** of **0.87**
- Employed **Random Forest Classifier** to predict the possibility of ICU admission with **90.65 %** accuracy

Image Processing for Mold Damage Detection | *ME206 Course Project* (Apr'22)

- Studied **anomaly detection** and reviewed **deep learning** techniques used in recognizing product defects
- Pre-processed raw images by applying **Gaussian Blur** filter and **Laplacian** filter to enhance the subject
- Designed a CNN model containing nine layers of **Conv2D** and **MaxPool** to get an accuracy of **90.04%**

Stock Market Predictive Modeling | *Self project* (Jan'22)

- Implemented a DL based predictive model and achieved MAE of **31** units **58.3%** directional accuracy
- Formatted the model to incorporate **p** past minute candles and flexibility to predict **n** next minute prices

threeD - A Scripting Language | *Seasons of Code, WnCC, IITB* (May'22 - Present)

- Coded a **lexer** prototype for the scripting language to be integrated into the game engine, **PhysicC**, developed by students and performed **lexical analysis** by generating custom **tokens** and **metadata**
- Designed the **syntax** for **constructors** along with the **Abstract Syntax Tree** for statement blocks

Options Pricing Models | *OneCard & Finance Club, IITB* (Jun'22 - Present)

- Coded the **Black-Scholes** Model and performed **Monte-Carlo** Simulations to predict the Option's prices
- Researched about **Options Greeks** and understood the **intrinsic** and **extrinsic** values of Options

SpO_2 Measurements using Pulse Oximeter | *ME226 Course Project* (Apr'22)

- Analyzed the working principle of **pulse oximeter** & modelled the circuitry as a **second-order** system
- Performed a detailed **error** & **calibration** analysis and calculated the **sensitivity** of the instrument

TECHNICAL SKILLS

Programming	C++, Python, SQL, HTML, C#
Software & Tools	Git, QGIS, MS Excel, Numpy, Pandas, Tensorflow, LaTeX

LEADERSHIP AND MENTORSHIP ROLES

Manager, Analytics Club | *Undergraduate Academic Council (UGAC)* (May '22 - Present)
Head of a 2-member team, responsible for catering to the interests of 10k+ students in the field of Analytics

- Ideated and executed **MakeMySummer with AI/ML**, a learning initiative taken by **20k+** global learners
- Revamped **Learners' Space** & moderated course on **Big Data Handling** with **1k+** student registrations
- Executed a full-fledged **Internship Preparation Program** in Analytics with a reach of **300+** students

Department Academic Mentor | *DAMP, Mechanical Engineering* (May '22 - Present)

- Part of a **43** member team selected from **140** applicants on the basis of rigorous interviews and peer reviews
- Mentoring **6** sophomores with their academic & co-curricular pursuits, pushing for all-round/personal growth

Convenor, Analytics Club | *Undergraduate Academic Council (UGAC)* (Jun '21 - Mar'22)

- Brainstormed & Implemented **Winter in Data Science** which attracted **800+** participants in **25+** projects
- Organised **various** competitions under the **Non-Core Weekend** with a total turnout of **400+** students
- Collaborated with **Career Nodes** to organise the **First-Ever Analytics GC** with **20+** inter-hostel teams

KEY COURSES UNDERTAKEN

CS & AI	C++ Programming, **Programming for Data Science**, **Data Structures & Algorithms**, Design & Analysis of Algorithms*
Mathematics	Linear Algebra, Single & Multi Variable Calculus, Differential Equations

*To be completed by Nov 2022

EXTRA CURRICULAR ACTIVITIES

Culturals	• Participated in Freshiezza **Solo** and **Group** Dance competitions hosted by InSync • Performed house dance and folk dance styles at **AIDS**, InSync's annual flagship event • Represented **Hostel-3** as a part of 15-member **Dance Squad** in the **Gyrations GC**
Sports	• Part of the **winning** team in **Freshiesta Fitness Competition** in the freshman year • Won the **Bronze** Medal in the **Inter-House** Cricket Tournament, Sports Day, class X
Technical	• Conducted tutorial sessions for a batch of 80 students being the **TA** for CE102 course • Received **3rd** prize in Pune in the **Honeywell SAE Student Design Challenge** • Amongst the top **40** students in Pune to be selected for the **Infosys** training workshops • Stood **9th** in **Whiz-Kid** logic competition, out of more than **5000** students in Pune