Tushar Nandy | **190020125**
Electrical Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 06-01-2001

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2023	
Intermediate	CBSE	Cambridge International School	2019	97.80%
Matriculation	CBSE	The Lawrence School, Sanawar	2017	10

Pursuing a **Minor** in **AI & Data Science** under C-MInDS

Scholastic Achievements

- Received **AP** grade (**Advanced Proficiency** given to **25/1122** students) in Physical Chemistry *(2020)*
- Acquired a merit based change of branch to Electrical Engineering (among **11/1000+** students) *(2020)*
- Granted **Award of Honour** by Dainik Jagran for standing **2nd in district** (CBSE Board Exams) *(2019)*
- Recipient of **LPUNEST** study grant for attaining **All India Rank 27** & **State Rank 2** (Punjab) *(2020)*
- Accredited with **KVPY fellowship** awarded by **Govt. of India** to **1500** out of **0.1 million** candidates *(2019)*
- Finished in the **top 0.11%** in JEE Main 2019 given by **9.35 lakh+** students across India *(2019)*
- Attained **99.48% percentile** in JEE Advanced 2019 given by **200,000+** students across India *(2019)*
- Recipient of the **Scholar's Tie** for exceptional academic performance in class 10 *(2016)*
- Awarded the Mahindra Search for Talent Scholarship for **4 consecutive years** *(2014-2017)*

Experience

Temperature Optimization of a Cement Kiln using Reinforcement Learning *(May - July 2021)*
Siemens India | Summer Internship

- Identified important **target parameters** and **control variables** in a **rotary cement kiln**
- Surveyed research papers on existing solutions and contrasted them with RL for process control
- Applied **delta pre-processing** to extract **time-delays** between changes in variable and their effect on the target parameters
- Developed a deep understanding of an existing architecture for **RL-based control** and **adapted** it to optimize the kiln temperature

Key Projects

RL for Finance *(March - July 2021)*
Seasons of Code | Web and Coding Club

- Learned basics of RL and implemented **Deep Q-Learning** to solve the **Mountain-Cart** problem
- Derived technical indicators such as **SMA, EMA, MACD, Bollinger Bands, STC** and **Momentum**
- Used **fourier transform** and **ARIMA** for denoising and **autoencoders** for high-level feature extraction
- Implemented **A2C, DDPG and PPO** on Dow Jones 30 and **beck-tested the strategy** using **FinRL**

Gender Recognition using Voice Samples *(May 2021)*
CS 419 (M) Course Project | Prof Abir De

- Extracted 21 acoustic features from **Mozilla voice samples** using tuneR package in R
- Applied **Kolmogorov-Smirnov** test to compare differences in features between male and female voices
- Contrasted the performance of **XGBoost, NNs, and SVM** attaining best accuracy of 99.10%
- Employed **precision, recall, AUC-ROC and accuracy score** as evaluation criteria for comparison

Football Match Prediction and Analysis *(December 2020)*
DS 203 (M) Course Project | Prof M Hanawal, A Sethi, S Sarawagi

- **Automated data cleaning** of web-scraped data present in **HTML** format using **BeautifulSoup**
- Analyzed particular team qualities and displayed **key match insights** using **SeaBorn** and **Matplotlib**
- Applied **Savitzky-Golay** filter to smooth the data and highlight **underlying performance** of teams
- Predicted match outcomes using **Random Forest, Naive Bayes and Neural Networks**
- Presented the results of basic and hyper-tuned models in addition to a comparison between the three

16-bit Arithmetic and Logical Unit *(December 2020)*
EE 224 Course Project | Prof Virendra Singh

- Implemented signed addition, subtraction, NAND and XOR using **structural VHDL** in Quartus Prime
- Applied the **Kogge-Stone** adder algorithm to design the fast adder and presented output in 2's complement
- Successfully tested the 16 bit unit by writing **test bench code** and analyzing output waveforms

Intelligent Agents *(March - July 2020)*
Seasons of Code | Web and Coding Club

- Developed a **Pattern Recognition software** capable of identifying periodic and exponentially growing sequences trying and testing different neural network architectures in TensorFlow and Keras
- Developed a **Song Recommendation System** utilizing **K Nearest Neighbors** to recommend songs based on recently played songs and skipped songs by tweaking hyper-parameters on each iteration
- Simulated a pandemic based on **urban mobility patterns** and **population densities** using **SIR Model**

Technical Skills

Programming	Python, C++, VHDL, R*, MATLAB*, Julia*
Python Libraries	SciPy, Sklearn, Matplotlib, Seaborn, Numpy, Pandas, TensorFlow, BeautifulSoup
Softwares	AutoCAD, SolidWorks, Jupyter, Keil (8051), emu8086

**familiar only*

Positions of Responsibility

Analytics Club Convener | Undergraduate Academic Council *(June 2020 - April 2021)*
Among the **12** *conveners selected out of* **100+** *applicants to represent the interests of* ***4500+*** *students*

- Worked in a **2-tier** team to revolutionize the operations of the club to adapt to the **COVID-19** crisis
- Successfully conducted sessions in collaboration with companies like **Netflix, Alphaa.ai and Univ.ai**
- **Interviewed professionals** in the field of Data Analytics for the **Analytics Career Series Blog**
- Charted and moderated a **3-week-long** course on **Data Analysis using Python**, attended by **300+**
- Designed and launched an **infographic series** for Instagram, improving the club's reach by **250%**

Academic Mentor | Department Academic Mentorship Program *(June 2021 - Present)*
1 out of 35 *students selected out of total 86 applicants*

- Mentoring 7 sophomore students and helping them with academics, course-planning and general difficulties

Teaching Associate | Prof. Vikram Gadre *(June - July 2021)*

- Assisted in conducting EE 229 (Signal Processing - 1) on the MOOC Platform, IITBombayX
- Helped the students of the course resolve their doubts and difficulties, encountered when learning the subject

Marketing & Media Coordinator | Techfest *(May - December 2020)*
Techfest: Asia's Largest Science and Technology Festival | ***Footfall: 175,000+ | Patronage: UNESCO***

- Strategized **brand activations** and **customized integrations** to enhance online engagement
- Assisted in the implementation of **HOPE**, a social initiative by Techfest on **Mental Health Awareness**, overseeing **150+** virtual workshops to sensitise college students in association with **10+ NGOs**
- Collaborating with **100+** neurologists and **Mar de Somnis**, a global non-profit organisation to train teachers in **150+ schools** to respond to epileptic seizures, under the aegis of **HEAL**, an initiative by Techfest
- **Automated** the data-basing of **1200+** sponsors by implementing **web-scraping** scripts in **BeautifulSoup**

Extracurriculars

Cultural	• Appointed as the **Executive Board Member** of the **SNAMUN** *(2020)* • Received the **High Commendation** at the **Techfest World MUN** *(2020)* • Participated in the **Annual Insync Dance Show** attended by **1500+** *(2020)* • Won the **1st** position at the first-ever **Mohinder Bilingual Turncoat Debate** *(2016)* • Adjudged as the **best speaker** in the **Kamla Jeevan National Hindi Debate** *(2016)* • Awarded the **Best Delegate** in **Security Council** at **SelaQui MUN** *(2016)* • Awarded the **Best Delegate** in **General Assembly** at the **SNAMUN** *(2016)*
Sports	• Awarded **Silver Medal** in the **Freshiesta Hockey Tournament** at IITB *(2019)* • Won the **Fateh Cup** for standing as the **best athlete** *(2014)* • Won **800m** for **3 consecutive years** in **Annual Athletics Meet** *(2014-2016)* • Finished **twice as the winner** and **once as the runners-up** in the Annual Hodsun Run Cross-Country race in the U-14 and U-16 categories *(2014-2016)* • Accredited with setting a **new record** in **800m** (best in over **150** years) *(2014)* • Completed a year-long training in athletics under National Sports Organization *(2020)*
Certification	• Completed the course **Data Analysis with Python** hosted by **IBM** *(2020)* • Completed **Object Oriented Programming in Python** by **LinkedIn** *(2020)* • Successfully finished **Scientific Computing in Python** by **MnP Club, IITB** *(2020)*