Piyush Tibarewal   **170050001**
Computer Science & Engineering   **B.Tech.**
Indian Institute of Technology, Bombay   **Gender: Male**
DOB: 04-02-2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	null
Intermediate	CBSE	Aklank Public School	2017	93.00%
Matriculation	ICSE	Anand Niketan - Satellite	2015	93.16%

Pursuing *Honors* in **Computer Science and Engineering**.

KEY PROJECTS AND PROFESSIONAL EXPERIENCE

Quantitative Researcher — Quadeye Securities LLP   *Remote Internship*
Developing Alphas Optimised for Ultra-Low Latency Execution   *Summer 2020*
- Developed a hybrid **linear model** by using **order imbalance and custom features** on Order Book data.
- Achieved **0.19** correlation between the generated signals and 5 sec return and **0.08** correlation for 60 sec return.
- Studied basic indicators such as **RSI, MACD and Bollinger Bands** to integrate them in the linear model.
- Implemented **pairs trading strategy**, testing both cointegration and distance methods to optimise profitability.

Matsya, Autonomous Underwater Vehicle (AUV)   *Autumn 2017 - Present*
RoboSub, AUVSI & US Office of Naval Research   *Guide: Prof. Leena Vachhani, Prof. Hemendra Arya*

AUV-IITB is an all-student team working on the design and development of an **AUV, Matsya***.*
The team were the ***joint winners*** *of the* **NIOT-SAVe** *competition among 18 universities from the country held at IIT-Madras in January-2019. We were* ***semifinalist*** *in 2018 and 2019 at the* **International AUVSI Robosub competition** *in San Diego, California amongst 47 teams from 10 countries.*

Software Subdivision Head: *Autumn 2019 - Present*
- Accountable for **managing and setting goals** for a team of 8 developers and coordinating with other divisions.
- Responsible for designing, maintaining and developing the **overall software** stack of the vehicle.
- The software stack localizes the vehicle, to perform naval missions using visuals, acoustics and various sensors.
- Assisted in **planning and execution** of the testing and preparations for the **NIOT-SAVe** and **handled the navigation** part. We are the only team in the history of competition to **complete all the tasks.**

Software Developer: *Autumn 2018 - 2019*
- Implemented a new **mission planner** for the vehicle which deals with dynamic selection of tasks. It was re-designed to **provide layers of abstraction** to make it more modular and less error-prone.
- Designed a new **driver** level architecture to handle **multiple processes**, spread across different packages, to read and write from one port using shared memory and locks.
- **Modeled the velocity** of the vehicle using the PWM data from different thrusters by training on various linear functions to complex neural networks analysing the **speed vs accuracy** trade-off.

Software Trainee: *Autumn 2017 - 2018*
- Developed a **Tuning Interface** for the controller using **QT** and **Robot Operating System** (ROS).
- Tested and improved the **Path Following** module and the **Velocity Controller** of the vehicle.

Underwater Remotely Operated Vehicle (ROV)   *Autumn 2019 - Present*
Larsen & Toubro Defence — Imprint II.C DST MHRD   *Guide: Prof. Leena Vachhani*
- Designing the software stack of a **ROV to be deployed in seawater** for scanning and maintenance in a joint effort by IIT-Bombay and Larsen & Toubro Pvt. Ltd. under the IMPRINT II.C initiative of MHRD.

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 37** in **JEE Advanced** out of 180 thousand candidates.   (2017)
- Secured **All India Rank 14** in **JEE Mains** out of 1.2 million candidates.   (2017)
- Qualified **National Standard Examination in Physics, Chemistry and Junior Science**.   (2015,2017)
- Qualified for **INMO**, Indian National Mathematics Olympiad, conducted by HBCSE.   (2015,2016)
- Recipient of the **NTSE Scholarship** and **KVPY Fellowship** granted by Government of India.   (2015,2016)
- Secured **All India Rank 12** in **Technothlon**, an international aptitude school championship.   (2014)
- Received **Certificate of Excellence** for scoring the **highest in Maths** in ASSET Test.   (2012)
- Stood **Champion** in **9th All India UCMAS Abacus and Mental Arithmetic Competition**.   *(2009)*

Internships And Projects

Emotix, RN Chidakashi Technologies Pvt. Ltd. *Internship, Summer 2019*

Emotix, a consumer electronic company, is the creator of India's first companion robot, Miko.

- Interpreted the source code of an **open-source system monitoring** software called **Monit**, and later customised it to fetch the list of active services and their corresponding details using **REST API** in C.
- Analysed and compared the **efficiency** of the **Akka framework** in Scala, which uses the actor model to achieve concurrency, against the traditional **Java threads**, with the help of **J-Meter**.

Stock Price Forecast *Course Project*

Prof. Pushpak Bhattacharya *Ongoing, IIT Bombay*

- Experimenting on **stock prices history, sentiments polarity and subjectivity, N-grams, customized text-based features** in addition to **features lags** to predict the stock prices of top influential companies.

BattleShip Game *Course Project*

Prof. Soumen Chakrabarti *Autumn 2018, IIT Bombay*

- Developed a web based application using the **server-client model** for the classic game BattleShip.
- Designed an interface to **challenge and play** against anyone online and simultaneously **chat** with them.
- Created interactive web pages using **ReactJS** which also support **real time rendering** of the results of the game and maintaining an overall leader-board using **NodeJS** and **MySQL** for the backend development.

Slidecast *Academic Project*

Prof. Varsha Apte *Spring 2020, IIT Bombay*

- Developed a prototype application from scratch which **records** keystrokes and audio synchronously while recording a lecture, and using that as our metadata, also **recreates a video like** experience for the student.
- Reduced the size of the metadata to view a 1 hour lecture to **100MB from 200MB** for a low quality video.

Humour Detection *Course Project*

Prof. Ganesh Ramakrishnan *Autumn 2019, IIT Bombay*

- Implemented a **LSTM** to detect humour on the Yelp dataset to achieve a **77.5%** accuracy.
- Employed techniques like stemming, lemmatisation, stop words removal and word embeddings for **pre-processing**.

Other Course Projects

- **Blockchain Technologies:** Prepared a thorough analysis on one of the popular cryptocurrency, **Cardano**. Studied the **Proof of Stake** algorithm and the concepts of **Sidechains** on Cardano platform.
- **Gameplay Optimization:** Designed a user-friendly UI and implemented a generic optimal game play strategy for strategic games using **Racket** language (functional programming). Used the **PSO (Particle Swarm Optimization)** algorithm to evaluate and allocate optimal use of resources.
- **Model for Image Splicing:** Implemented a model to **detect image forgery** and showed that image splicing increases the value of the bi-coherence magnitude, phase features and a prediction of 90 degree phase bias.
- **Mini Compiler**: Used Lex and Yacc for tokenising and parsing, to create **Abstract Syntax Trees and symbol tables**. Supported functionalities like if-else statements, loops and arithmetic expressions.
- **Defending Flush and Reload Attacks**: Studied and analysed a research paper titled **Software Approach to Defeating Side Channels in LLC** (Last Level Caches).
- **Android App Development**: Designed and implemented an **Android Application** that can search for a user and fetch the details of his/her GitHub's public repositories using **GitHub APIs**.

Technical Skills

Programming Languages	C, C++, Python, R, Bash, Java, Scala, SQL, Racket, LaTeX, JavaScript
Software/Packages	Git, TensorFlow, PyTorch, Numpy, MATLAB, ROS, Gazebo, WireShark

Positions Of Responsibility

Department Academic Coordinator *2020 - Present*

- **Leading** a team of 31 mentors to increase academic outreach and **counsel** 150 students in the department.
- Facilitating **regular interaction** between faculty and students to help adapt to the online ecosystem.

Institute Student Mentor and Department Academic Mentor *2019 - Present*

- Responsible for **guiding** 6 sophomores and incoming freshmen in their academic & co-curricular pursuit.