Mithil Vakde
UG Freshman
Chemical Engineering
IIT Bombay

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ACADEMIC DETAILS

Examination	Board	Institute	Year	%
Intermediate/+2	Department of PUE, Karnataka	DCFL Pre University College, Bangalore	2019	88.67
10th Board	ICSE	New Horizon Public School, Bangalore	2017	96.5

Interests

- I love exploring and learning various topics in physics and mathematics.
- I hope to narrow down my interests in physics in the next few years by exploring them here at IIT Bombay and afterwards pursue higher studies and eventually, research in physics.
- I'm pursuing a change in branch to Engineering physics at the end of first year
- Currently pursuing 2 online courses on edX:
  - Mastering Quantum Mechanics Part 1: Wave Mechanics (MITx - 8.05.1x)
  - Quantum Information Science I, Part 1 (MITx - 8.370.1x)
- I work on tech projects in Machine learning as a hobby

Scholastic Achievements

- Was among the 25 selected to attend the *Orientation cum Selection Camp 2019* for the **International Olympiad in Astronomy and Astrophysics** by qualifying the **Indian National Astronomy Olympiad** (INAO) (2019)
- Awarded Certificate of Merit for being among the **Statewise top 1%** in the National Standard Examination in Astronomy (**NSEA**) (2018)
- Achieved All India Rank 1087 in *Kishore Vaigyanik Protsahan Yojna* (**KVPY**) and awarded fellowship again (2018)
- Attended National Science (Vijyoshi) Camp held at IISc, Bangalore (2018)
- Achieved All India Rank 326 in *Kishore Vaigyanik Protsahan Yojna* (**KVPY**) and awarded fellowship (2017)
- Won 2nd Place at the **Bangalore Teen Hackathon 2017**, conducted by **IBM** (2017)

Positions Held

- **Trainee - Innovation Cell, IITB** | Machine Learning Subsystem
  A student-run design and engineering center that develops technological innovations and participates in national and international competitions
  - Part of a team that is develops **autonomous unmanned aircraft systems** with *navigation, reconnaissance, package delivery* and other capabilities
  - Completed various projects like engineering a self balanced arm, programming OCRs, implementing PID controllers, various classifiers and neural networks, etc.
  - Studied various topics related to machine learning, deep learning and basics of PID controls and computer aided vision

Projects

- **OCR on Natural Image Backgrounds** (ongoing, final stages of refinement)
  Innovation Cell | BSDC project - Machine Learning subsystem
  - Built a program that detects and recognizes alphanumeric text on any background - not just white documents - which is a significantly harder problem and a topic of ongoing research
  - Program is to be implemented on our **unmanned autonomous flying vehicle** and is to work on videos captured by it in **real time**
  - Uses MSER method to detect the text and transfer learning on MobileNet architecture to recognize the text detected
- **Optical Character Recognizer** (Jan - Feb 2020)
  Hobby project
  - Objective: **Detection and recognition of alphanumeric text in documents**
  - Made multiple iterations of this project with various neural network architectures trained on different data sets
  - Achieved various accuracies on each iteration with highest being 96%
- **Self Balancing Arm** (December 2019)
  Innovation Cell project
  - Engineered an arm that balances horizontally via propellers
  - Built and implemented a PID controller to keep the arm stable
- **Titanic Challenge-Kaggle**
  (November 2019) *Hobby project*
  - Performed data cleaning and exploratory data analysis on the titanic dataset
  - Implemented logistic regression model, decision tree classifier and a random forest classifier to get a best accuracy of 83% on test data as a part of the Titanic Challenge
- **Emotion Extractor**
  (December 2016 - Jan 2017) *Bangalore teen hackathon*
  - Created an app that **extracts the strongest emotions** conveyed in social media text posts
  - Scours social media based on a given query and evaluates the post using IBM Watson's **Artificial Intelligence APIs**
  - Creates and documents statistics for each post and all information is structured in a JSON format

TECHNICAL SKILLS

- **Languages** : Python, Java, C++,
- **Softwares** : MATLAB, GNU Octave, Node-RED, Git, LaTeX, AutoCAD, Solidworks
- **Development** : HTML, CSS

Extracurricular activitites

- Was a part of the **IIT Bombay dance** team that won 2nd place overall in the inter-IIT dance competition held during *Cultural Meet 4.0*
- Engineered a **remote controlled bot** capable of negotiating different obstacles through a 100m track
- Engineered a **remote contolled plane** that achieved controlled flight for the *RC Plane Competition, 2019* conducted by the Aeromodellers Club
- Appointed **School Captain, New Horizon Public School** for the academic year 2016-17
- Became a finalist in the Wiz **National Spelling Bee Finals 2017** held in Kolkata (after a year long of knockout rounds) and placed 23rd all India.
- Appointed **School Vice-Captain, New Horizon Public School** for the academic year 2015-16
- Qualified for and attended the **Spark Catch Them Young** summer training program in IT Concepts conducted by and held at **Infosys, Bangalore** (2015)
- Was a part of the **highschool volleyball team** and won various inter-school and state level tournaments