Mithil Vakde CPI: 8.93/10
Third Year Undergraduate at IIT Bombay mvakde@iitb.ac.in
B.Tech in Engineering Physics and Minor in Mathematics github.com/mvakde

ACHIEVEMENTS

Scholastic

- **Top 25 countrywide** in the Indian National Astronomy Olympiad; invited to **OCSC '19**, the final stage of selection of the **Indian delegation to the International Olympiad in Astronomy and Astrophysics** ['19]
- One among the **73 undergraduates selected nationwide** for the **NIUS** (Physics) program at **TIFR** ['20]
- **99.6th percentile** in JEE Main; **ranked 1506** in JEE Advanced (**0.9 & 0.16 million** candidates resp.) ['19]
- Recipient of the **KVPY fellowship** (funded by the Govt. of India); secured an **All India Rank of 326** ['18]

Technical

- **Runner up**, **IBM Bluemix hackathon** for developing a twitter monitoring AI tool using Watson's NLU API; successfully pitched the app to **industry leaders** and beat experienced teams **2 years senior** ['16]

POSITIONS OF RESPONSIBILITY

Coordinator - AeRoVe
Aerial robotics team
[Sep'19 – Sep'20]

***Impact**: Secured **INR 0.8 million in funding** through a grant proposal pitched to the STP committee, IRCC*

- **Reduced expenses by 40%** per aircraft by finding inexpensive procurement methods
- Designed a **rigorous 7-day training** program for recruits & mentored them through a **month-long project**

Student Mentor
[May'21 – Present]

One of the 13 juniors in a team of 120 seniors selected to provide support to the student community

- Assisted **180+ students** in planning their careers by **connecting them to alumni** and **hosting talk sessions**
- Mentoring **8 sophomores and 11 freshmen** through academic and interpersonal challenges

Teaching Assistant
(Fall '21)

***PH 107, Quantum Physics and Applications** | Instructor: Prof. Sunita Srivastava*

- Responsible for guiding **45** students, conducting weekly tutorials and evaluations, and grading exams

RESEARCH AND COURSE PROJECTS

UMIC
Jr. Machine Learning Engineer
[Sep'19 - Sep'20]

Impact**: Designed the ML subsystem of the **world championship winning** **aerial robot

- Developed **deep learning** code that can recognize **10-inch** characters in **complex backgrounds 80+ft** away
- **Reduced the runtime 45x** by integrating a custom-built classification algorithm with YOLOv4
- Achieved an **F1-Score of 0.81** despite capturing blurry frames due to high drone velocity
- Cleared the concept review & preliminary design review rounds of the **Barcelona Smart Drone Challenge**

Liquid State Machines
[Sep'21 - Present]

Guide: Prof. Udayan Ganguly | Course project on applications of neuromorphic engineering principles

- Analysed the working of Liquid State Machines in MATLAB by varying parameters such as synapse order
- Implemented an original idea and obtained an accuracy of 75% on the model

PT-symmetric optics
[Jan'21 - May'21]

Guide: Prof. Anshuman Kumar | Course project on optical Phenomenon in balanced gain-loss systems

- Conducted a literature review of **non-hermitian hamiltonians** in optics and its resulting applications
- Implemented the Abeles' matrix formalism **in python**; plotted non-trivial ATRs and CPA laser points

Chaotic attractors
[Sep'20 - Dec'20]

*Guide: Prof. Amitabha Nandi | Course project on chaotic systems and their **fractal properties***

- Calculated and **plotted multidimensional chaotic trajectories** of 5 attractors using **Runge-Kutta** methods

Analysis of proton - proton collisions
[Oct'20 - Dec'20]

*Guide: Prof. Sadhana Dash | Course project on the Interpretation of **high energy data***

- **Reconfirmed deviations** from the expected results of the transverse momentum of emitted particles
- Analysed **19 million datapoints** (Monte Carlo data of 13 TeV collisions from PYTHIA 8) in CERN's ROOT

MISC.

Technical Skills

- Programming: Python, Tensorflow, Keras, C++, MATLAB
- Software: SolidWorks, AutoCAD, Arduino IDE

Extracurricular Activities

- Represented IIT Bombay **all over the country** and won prizes at prestigious dance competitions:
  - **Winner**: Zest '21 at IIIT Hyderabad
  - **2nd place**: 7 Lakes Fest '20 at IIM Calcutta
  - **2nd place**: Inter-IIT Cultural Meet '19
  - **Finalist**: Desi Beats, Mood Indigo '20
- **Hosted a live concert of the National Film Award winner**, Rekha Bharadwaj, in front of **2000+ people**