Onkar Deshpande
Computer Science & Engineering
Indian Institute of Technology Bombay

170050009
UG Third Year (B.Tech.)
Male
DOB: 07/12/1998

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2020	9.79
Intermediate/+2	Maharashtra State Board	Deogiri College Aurangabad	2017	89.23
Matriculation	CBSE	Tender Care Home	2015	10.00

Pursuing **Honors** in Computer Science and Engineering

Scholastic Achievements

- Achieved All India Rank **8** in JEE (Advanced) among 150,000 eligible candidates *(2017)*
- Awarded **Institute Academic Prize** from IIT Bombay for excellent academic performance *(2018)*
- Secured All India Rank **208** in JEE Mains out of a total of 1.4 million eligible candidates *(2017)*
- Currently ranked **3** out of **126** students in Computer Science and Engineering Department *(2019)*
- Awarded Gold Medal-National **Top 35** and Certificate of Merit in **INChO** *(2017)*
- Among National Top **1%** in National Standard Exam in **Astronomy** among 16220 students *(2017)*
- Selected in National Top **1%** in National Standard Exam in **Physics** among 44174 students *(2017)*
- Bagged **AP** grade in the Abstractions and Paradigms for Programming course *(2018)*
- Recipient of prestigious **NTSE Scholarship** by NCERT, Government of India *(since 2015)*
- Secured KVPY fellowship with All India Rank **24** in written and interview examination *(2015)*

Projects and Internships

Liveness Verification in Broadcast Networks *Summer 2019*

Prof. Roland Meyer and Peter Chini | Internship *TU-Braunschweig, Germany*

- Implemented an algorithm for Liveness Verification in Broadcast Networks that runs in **polynomial time** and is based on Kleene fixed point iteration. Created a C++ class for the same
- Developed a generalization for the **Symbolic** case, also provided a C++ implementation
- Worked on ideas for a model-checker for parameterized programs. These communicate via a shared memory with atomic read and write accesses and **Compare-and-Swap** commands

Weak Memory models *Autumn 2019-Ongoing*

Prof. Krishna S. Narayanan | RnD Project *IIT Bombay*

- Working on the **Reachability** problem of weak memory models with causally consistent transactions
- Will reduce specific cases of the problem to known reachability and coverability problems

Game Theory *Summer 2018*

Summer of Science | Maths and Physics club *IIT Bombay*

- Explored the proof and applications of **Nash equilibrium** and Mixed Strategy equilibrium
- Read about various strategic games including Cournot's Oligopoly and Bertrand's Oligopoly

Protection Against Sophisticated DOS attacks *Spring 2019*

Prof. Bernard Menezes | Course Project *IIT Bombay*

- Implemented a Python Daemon that maintains real time profiles of each user, detects Sophisticated DOS attacks and communicates with the server to block malicious users through two layer filtration
- Developed a C++ library that protects any server with minimal code and performance overhead
- Based on a paper titled Rampart which was presented in USENIX Security Symposium 2018

Secure Personal Cloud *Autumn 2018*

Prof. Soumen Chakrabarti | Course Project *IIT Bombay*

- Made a cloud based file synchronization and backup service for multiple clients using **Django** web framework integrated **SQL** database for storing content robust to deadlocks and overloading
- Making Web and Linux clients using **jQuery** and **Linux Daemons** to upload, share and sync files
- Used block-level encryption(**AES-CBC, ARC4, and Blowfish**) for encrypting data on server database to ensure security and privacy without compromising efficiency and speed

Optimizing Gameplay *Spring 2018*
Prof. Amitabh Sanyal | Course Project *IIT Bombay*
- Created a **Racket** Program that evaluates optimal game plan to play an economic strategy game
- Applied heuristic **Particle Swarm Optimization** to evaluate optimal solution in efficient manner
- Used Racket Graphical Interface Toolkit to make user-friendly UI for input and output

Match and Parse Action at a Router *Spring 2019*
Prof. Ashwin Gumasthe | Course Project *IIT Bombay*
- Simulated circuit using **VHDL** to extract, lookup and process bytes of input packet to router
- Designed and implemented **leaky bucket** algorithm for Rate Limit Logic for individual flows
- Implemented in **cut-through** mode for minimum processing delay and faster speeds

Other Projects

- **SAT Solver***: Used Davis-Putnam-Logemann-Loveland(**DPLL**), a backtracking based efficient algorithm for the SAT problem and used it to find a solution of the n-queens problem and Sudoku
- **Socket Proramming***: Implemented terminal-based **POP3**-like file transfer protocol capable of handling multiple simultaneous clients, various errors and bi-directional traffic using TCP protocol
- **Regex matching***: Implemented a tool in Racket that converts a Regex to a Deterministic Finite Automata(**DFA**) by first converting it to an expression tree for efficient matching
- **Chrome Extension***: Created a Google Chrome Extension to detect and block **XSS** attacks
- **Semi-Autonomous Bot**: Made an Arduino-controlled bot which used **PID** algorithm to analyse readings from IR and ultrasonic sensors to detect environment and determine futher trajectory

**Course Projects*

Technical Skills

Programming Languages	C++, Racket, Python, Java, Prolog, Bash, Sed, Awk, Arduino
Web Development	JavaScript, JQuery, CSS, MaterializeCSS, PHP, HTML5

Positions of Responsibility

Mentor *in Department Academic Mentorship Program* *April 2019-Present*
- Mentoring 5 students so that they make the most of academic opportunities available in the institute
- Acting as a communication channel between faculty and students and respond proactively to the needs of both. Helping carry out new initiatives such as course mentoring and restructuring

Teaching Assistant *for Logic for Computer Science(Minor) course* *August 2019-Present*
- Conduct one tutorial and doubt session of a class of 100 students every fortnight
- Responsible for checking of exam papers and conveying appropriate feedback to the instructor

Teaching Assistant *for Quantum Physics and its Application course* *Autumn 2018*
- Mentoring and teaching a class 50 students and evaluating their performance

Infrastructure Coordinator, *Techfest 2018* *August-December 2018*
- Responsible for complete management and handling of Lecture Hall Complex which hosted 5 competitions, 20+ workshops, TF-Summit and TF-Model United Nations with 1500+ participants

Extracurriculars

- Completed a one-year course under National Sports Organization (**NSO-Volleyball**) *(2017-18)*
- Represented Hostel-9 IIT Bombay in Inter-hostel **Swimming** General Championship *(2018)*
- Attended **Vijyoshi Camp**, organized by the **Indian Institute of Science(IISc.)**Bangalore *(2017)*
- Lead to an **Article** about New Undergraduate Academic Departments in the Fresher Newsletter 6.2 published by Institute **Media body** Insight to help Freshers know facts and decide better *(2019)*
- Engineered a **Bluetooth-controlled bot** in XLR8 organized by Electronics and Robotics club and were among the **top 3** teams which completed the task set by AUV Team of IIT Bombay *(2017)*
- **Organizer** for Mood Indigo (Competitions Department) and Techfest (Competitions Department), Asia's Largest College Cultural and Technical festival attended by over 140,000 students *(2017)*
- Mentor to 4 students in **Season of Code** in implementing a POP3-like server and client *(2019)*