Neil Dalal
Electrical Engineering
Indian Institute of Technology, Bombay

16D070014
Dual Degree (B.Tech. + M.Tech.)
Gender: Male
DOB: 12-05-1998

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	
Intermediate	HSC	Pace Junior Science College	2016	90.90%
Matriculation	ICSE	Cathedral & John Connon	2014	96.30%

Completed **Minor Degree** in **Computer Science and Engineering** with CPI of **8+**

Internships & Research Experience

Cuff-less Continuous Blood Pressure Monitoring System | Sony Japan
May'19-Jul'19

Research Intern, Intelligent Application Technology Development, Sony Corporation, Tokyo

- Offered a **pre-placement interview** for showing an exceptional performance in the vital signs sensing field
- Developed and evaluated various **cutting-edge cuff-less continuous** blood pressure sensing technologies
- Applied **signal processing** techniques to filter out **noise and artifacts** from human sensing signals (ECG,PPG,LDF)
- Built a cuff-less continuous blood pressure estimation model using **machine learning** and **statistical data analysis**
- Researched how **physiological activities** affect human sensing signals and hence the accuracy of our model
- Recommended by Sony HR for having **good personality, communication skills** and **well fit to work in Japan**

Anomaly-Based Network Intrusion Detection System | Master's Thesis
Jan'20-Present

Guide : Prof. Gaurav Kasbekar, Electrical Engineering

- Build an Intrusion Detection System capable of detecting **novel, zero-day attacks** on latest 802.11 Wi-Fi standards
- Examined and researched attacks and **design flaws** in the current **state-of-the-art WPA3** Wi-Fi certification
- Performed **ethical hacking & penetration testing** to find security vulnerabilities in modern Wi-Fi Access Points
- Aim to develop **novel, advanced** machine learning algorithms with a high accuracy and a **low false positive** rate

Software Development Intern | SpeedLabs
Nov'17-Dec'17

Developed a personal guidance and technology practice platform for students worldwide

- Worked with the **software development team** & improved the architecture for the Edtech platform
- Devised **new algorithms and features** for the software to make a student's learning more personalized.
- Analyzed the software architecture and improved the existing content by adding more patterns
- Designed and ideated patterns that significantly improved the overall presentation and quality

Key Projects

Digitally Programmable Analog Computer
Jan'19-May'19

Guide: Prof. Mukul Chandorkar, Electrical Engineering

- Proposed a hybrid system of analog and digital modules which solves **non-linear** differential equations in **8 variables**
- Designed an **analog module** using integrators and interfaced it with a micro-controller to compute non-linearities
- Implemented the system on a two-layered **printed circuit board** with on-board power management using EagleCad

Security Analysis of Wi-Fi standards & IOT devices
Jan'20-May'20

Guide : Prof. Gaurav Kasbekar, Electrical Engineering

- Achieved close to **state-of-the-art** attack detection and classification accuracy using a **deep learning** algorithm
- Analysed and discovered attacks exploiting vulnerabilities, capabilities, and limitations of various **IOT** devices

Wireless Encrypted Messenger System
May'18-July'18

Guide : Prof. Madhav P. Desai, Electrical Engineering Department

- Developed a **messaging system** to **wirelessly exchange messages** between two Altera's MAX V CPLDs
- Implemented a symmetric key **encryption algorithm** making the system safe and secure from attackers
- Optimized the code using checking algorithms to drastically increase the transmission **efficiency** and **reliability**
- Coded a powerless keypad to simulate a total of **32 keys** including A-Z, space, backspace, enter, delete, etc

Deep Learning based enhancement of low-light images
Aug'20-Present

Guide : Prof. Amit Sethi, Electrical Engineering — *Course Project*

- Developing an algorithm to **remove noise** and enhance the colors and brightness of a low-light image
- Building a model to help improve the **state of the art night-mode** camera feature for smartphones

Automatic Command Word Recognition
Sept'19-Nov'19

Guide : Prof. Preeti Rao, Electrical Engineering — *Course Project*

- Designed and trained a **GMM-HMM model** to automatically recognize a word spoken from a command set
- Achieved more than **89% accuracy** of correct detection and classification for this speech recognition model

Electronic Stethoscope
Feb'18-Apr'18

Guide : Prof. Siddharth Tallur, Electrical Engineering — *Course Project*

- Designed a circuit to **convert heart sounds into electrical signals** and displayed them on an oscilloscope.
- Drastically reduced the dependence of a diagnosis on the sensitivity of a medical practitioner's ear
- Identified the different sources of **noise** and **filtered** them out selectively from the internal body sounds, using carefully calculated filters characteristics, resulting in a better, cleaner, more reliable and more accurate waveform

Reaction Time Calculator
Feb'18-Apr'18

Guide : Prof. Madhav P. Desai, Electrical Engineering Department — *Course Project*

- Programmed a CPLD in **VHDL** to calculate the reaction time of a user and displayed it on an LCD in real time
- Debounced the switches by modelling them as **FSMs**, thus eliminating false positive button presses
- Modelled the calculator **foolproof** by dis-qualifying the user if he presses the button before the LED glows

Technical Skills

- Programming Languages : C++, Python, VHDL, Arduino IDC
- Tools : MATLAB, TensorFlow, Keras, Pytorch, OpenCV, NumPy, AutoCAD, EAGLE, SOLIDWORKS, Adobe PS
- **Senior Member** at xdadevelopers.com with **140+** Thanks for providing Android related technical support
- **Tech Wizard** at drippler.com, resolving Android OS related technical issues faced by people **worldwide**

Scholastic Achievements

- Secured **All India Rank 333** out of 150,000 candidates in JEE Advanced [2016]
- Acquired **All India Rank 263** out of 1.3 million candidates in JEE Mains [2016]
- Awarded **Rs. 300,000 Scholarship** by PACE for exceptional performance in its aptitude test [2014]
- Graduated in **UCMAS - Abacus and Mental Arithmetic** by successfully completing all the 10 terms [2010]
- Achieved **Rank 10** and a gold medal in the prestigious Mental Maths Competition at Mumbai level [2007]

Positions of Responsibility

Internship Coordinator
Apr'18-Mar'19

Institute Placement team, IIT Bombay

- Unanimously selected and entrusted to secure and streamline Internships for **1800+** students of IIT Bombay
- Awarded a **Special Mention** in a team of 21, for outstanding work & valuable contributions to placement team
- Built and fostered relations with leaders across **50+** firms and professors across **20+** renowned universities globally
- Envisaged **20%** increase in internships through targeted contacting and collaboration with professors
- Conducted several preparatory sessions to help students with intern preparation and other soft skills

Teaching Assistant | IIT Bombay
Aug'20-Present

Selected as Teaching Assistant for EE 679: Speech Processing

- Upskilled the performance of **50+** students by collaborating with the instructor and helping conduct weekly lectures

Key Courses Undertaken

Computer Science	Advanced Machine Learning*, Digital Image Processing, Computer and Network Security, Data Structures and Algorithms, Operating Systems (*To be completed by Dec'20)
Electrical Engineering	Speech Processing, Cryptology, Cryptography and Number Theory, Signals & Systems, Optimization, Information Theory, Analog and Digital Systems, Microprocessors

Extra Curriculars

- **Japanese language** : Basic Japanese words, can read and write Hiragana, Katakana & 100+ Kanjis (N5 level)
- Trained professionally in **Badminton** under **National Sports Organization** (NSO) and a Hostel Badminton General Championship Player - Chosen unanimously from among **120+** other competitors
- Awarded **Best Player** in MCF Club **Chess** Tournament for strategic gameplay and thought process
- **Adventures & Travel** : Visited 12 countries. Bungee Jumped, Sky Dived, Shark Cage Dived. Hiked Himalayas.

Scholastic achievements and extracurricular activities are not verified by the Placement Cell