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| **Himanshu Pradeep Aswani** | | | **160110028** | |
| **Electrical Engineering** | | | **Dual Degree (B.Tech. + M.Tech.)** | |
| **Indian Institute of Technology, Bombay** | | | **Gender: Male** | |
| | | | **DOB: 27-05-1998** | |

| Examination | University | Institute | Year | CPI / % |
|---|---|---|---|---|
| Graduation | IIT Bombay | IIT Bombay | 2021 | ■ |
| Intermediate | HSC | LATE P.B.JOG JUNIOR COLLEGE FOR SCIENCE AND COMMERCE | 2016 | 94.00% |
| Matriculation | ICSE | THE BISHOPS CO-ED SCHOOL, UNDRI | 2014 | 96.60% |

## SCHOLASTIC ACHIEVEMENTS

- Completed a **Semester Exchange Program** at **National University of Singapore, Singapore**    2019
- Pursuing a **Minor** in **Computer Science and Engineering**    2020
- Awarded **A+** grade for exceptional academic performance in **Matrix Computations** at **NUS**    2019
- Awarded **Branch Change** to Electrical Engineering based on exceptional academic performance    2017
- Secured **98.42 percentile** in **JEE Advanced** and **99.90 percentile** in **JEE Main**    2016
- Stood **First in High School** in 12th standard Maharashtra HSC board examinations with 94.00%    2016
- Stood **First in School** in 10th standard ICSE board examinations with 96.60%    2014
- Certified as **Abacus GrandMaster**, ranked **International Rank 5** in Level 8 held in **Malaysia**    2009

## PROFESSIONAL EXPERIENCE

**Qualcomm Software Engineer**    May 2019 - July 2019
*Internship*
- **Conducted** research on the status and techniques of Image Quality Improvement using day-to-day cameras
- **Executed** a number of **model evaluations** related to image quality improvement on the **AWS Cloud**
- Worked primarily in **TensorFlow** and **Keras** and dealt with **Deep Convolutional Neural Networks** and explored possible uses of **Generative Adversarial Networks** and **AutoEncoders** for the same

**Web Development Engineer**    May 2018 - June 2018
*BSBE Department, IIT Bombay*
- The project involved writing code of about 1500+ lines for an **online search database**
- **Developed** the **back-end** of the website in **MySQL** and **PHP** hosted by **Apache Server**
- The **front-end** of the website was written in **CSS** and **HTML** and the design was implemented via **Bootstrap**

**Quantitative Analyst Trainee**    February 2018 - May 2018
*In-Semester Internship - Auquan*
- **Received** training in quantitative finance to develop predictive models for stock price movement in Python
- **Completed** a Capstone Project: **"LSTM Prediction Model to develop Long Short Equity Strategy"**

## RESEARCH EXPERIENCE

**Functional Evolution In Neural Networks For Multi-Task Learning | M.Tech Thesis**    Present
*Guide: Prof. Amit Sethi*
- **Explored** techniques for **transferring learning** to develop multiple task capabilities in a single neural network
- **Working** on devising an algorithm to **guide neural network augmentation** with **function specific modules**
- **Studied** probabilistic methods for calibration of model uncertainty using inference tools for detecting **OOD** samples
- **Investigating confidence prediction** methods for TCGA lung dataset using **Bayesian neural networks**

**Modular Neural Networks**    January 2020 - June 2020
*Guide: Prof. Amit Sethi, Course: Supervised Research Exposition*    *Academic Project*
- **Conducted** an extensive literature survey that explores the notion of functional modules in neural networks
- **Implemented** papers that employ **spectral graph clustering techniques** to identify structural clusters
- **Multiple architectures** with variations in activation function and topology were trained, on three easily available and popular datasets, **MNIST**, **FashionMNIST** and **CIFAR10**, primarily in **PyTorch**

**CoViD-19 Pandemic Spread Analysis**                                                  April 2020
*Guide: Prof. D. Manjunath*                                                          *Academic Project*
- Explored **statistical SIR models** to appropriately model the nature of spread of CoViD-19 in India
- Three different models, each one **uniquely accounting for asymptomatic and symptomatic case** counts, were **simulated** for **four countries** to understand differentiating factors underlying spread rates
- **Submitted** an article on Research Gate titled: **'On the early spreading rate of CoViD-19 in India'**

## COURSE PROJECTS

**Non Invasive Glucometer**                                              January 2019 - April 2019
*Guide: Prof. Shalabh Gupta, Course: Electronic Design Lab*                          *Course Project*
- **Conducted** researched on current principles underlying commercial glucose meters available today
- **Implemented** two different realms of non-invasive techniques, optical and transdermal, utilising **Infrared** and **Ultrasound** respectively and compared the accuracy with a commercial invasive glucometer
- **Fabricated** the required PCB designs using Eagle software to form a conveniently usable prototype
- Achieved **90%** accuracy with the invasive as our reference, using **Arduino Mega Board** for ADC purposes

**Digital Hearing Aid Devices**                                                       March 2019
*Guide: Prof. Vikram Gadre, Course: Digital Signal Processing*                       *Course Project*
- **Developed** code in MATLAB to design the three major components of the sound processing algorithm in a digital hearing aid device, namely, **Noise Reduction Filter**, **Frequency Shaper** and **Amplitude Shaper**

**Digital Photography with Flash and No-Flash Image Pairs**                        November 2018
*Guide: Prof. Suyash Awate and Prof. Ajit Rajwade, Course: Digital Image Processing*  *Course Project*
- **Implemented** a research paper based algorithm to understand **transfer of high frequency details**
- **Programmed** further modifications to introduce **continuous flash adjustment** feature for an image

**Smart Solar Powered Irrigation Control System**                       January 2017 - April 2017
*National Service Scheme*                                                            *Course Project*
- **Conducted** researched on inefficiencies in the irrigation framework currently employed in agricultural farms
- Built a **working prototype** of the model consisting of sensors and analyzing data via a micro-controller
- **Advocated** code in **Android Studio** to monitor sensor data via an Android App to control flow of water

## POSITIONS OF RESPONSIBILITY

**Graduate Teaching Assistant - Advanced Topics In Machine Learning**    August 2020 - December 2020
- **Responsible** for evaluation of assignments, resolving doubts and conducting exams for **100+** students

## TECHNICAL SKILLS AND COURSES

- **Software Expertise**: PyTorch, TensorFlow, MATLAB, Python, HTML, Java, C++, SQL, LaTeX, VHDL
- **Electrical Engineering**: An Introduction to Number Theory and Cryptography, Network Security, Information Theory and Coding, Cellular Mobile Communications, Digital Signal Processing, Matrix Computations
- **Computer Science and Engineering**: Data Structures and Algorithms, Design and Analysis of Algorithms, Computer Networks, Operating Systems, Introduction to Machine Learning, Logic for Computer Science
- **Online Courses**: Welcome to **Game Theory** (University of Tokyo), **Spanish** Vocabulary (Meeting People) (UC Davis), **AI for Everyone** (deeplearning.ai), Introduction to **Big Data** (UC San Diego)

## EXTRACURRICULAR ACHIEVEMENTS

- Stood **Second** in **Stock Pitch**, a virtual stock market trading competition, organised by E-Cell    2019
- Wrote **two course reviews** to guide incoming students to the Computer Science Minor program    2018,19
- Member of **Gold** winning team in **Institute Football League**, conducted by **IIT Bombay Sports**    2018
- Ranked **Second Runner-Up** in the **Limca Book of Records** Inter school quiz held in Pune    2012
- Awarded **City Topper** in the **Bournvita Quiz** and represented the city at the National Level    2011
- Passed the International Standard of **Abacus Mental Arithmetic** Proficiency Examination    2009
- Passed the International Standard of **Abacus Mental Computation** Proficiency Examination    2009
- Interests mainly comprise watching and playing football and reading fiction