Ayush Baid | **12D100002**
Electrical Engineering | **Dual Degree (B.Tech+M.Tech.)**
Indian Institute of Technology Bombay | **Male**
Specialization: Communication & Signal Processing | **DOB: 03/01/1995**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2017	9.14
Intermediate/+2	CBSE	Lancers Army School	2012	94.60
Matriculation	ICSE	Metas MCD School of SDA, Surat	2010	94.86

SCHOLASTIC ACHIEVEMENTS

- Completed a **minor degree** in **Computer Science and Engineering** with a CGPA of 8.4 *2016*
- Among 9% students awarded **branch change** after freshmen year in IITB on the basis of grades *2013*
- Ranked in **top 50** in Technothlon, an international school championship by Techniche, IIT Guwahati *2009*
- Ranked in top 1% statewide in National Standard Examination in Junior Science, conducted by IAPT *2009*

PROFESSIONAL EXPERIENCE

Sony Corporation, Tokyo | Software Engineering Intern *May 2015 - Jul 2015*

- Designed new **cloud based testing environment** for Android devices and upgraded existing framework's APIs
- Analyzed and evaluated the performance of **Android virtualization frameworks**
- Developed stubs in Android's source code to workaround the restrictions of native emulator
- Coded and evaluated automated tests for Android devices

FOSSEE | Developer, Scilab Signal Processing Toolbox *Dec 2015 - Present*

The team develops and promotes free and open-source software in education as part of an initiative by the Govt. of India

- Coded functions in Scilab to emulate their MATLAB counterparts as a part of 5-member team
- Studied and implemented algorithms from areas including pseudospectrum evaluation, filter estimation

RESEARCH PROJECTS

Laparoscopy Image Enhancement | Graduate Dissertation *Jan 2016 - Exp. Jun 2017*

Alleviating smoke, noise, and speckles observed in laparoscopy images — Prof. S. Awate, Prof. S. Merchant

- Modeled a **novel** joint optimization framework using **Markov Random Fields** to impose priors on the variables
- Studied and implemented priors using non-negative sparse coding and kernel density estimation
- Exploring various optimization strategies including **Expectation-Maximization (EM)** and **Variational Bayes**

Temporal Super-Resolution in Videos *Feb 2015 - Apr 2015*

Increasing frame rate of videos using spatio-temporal correlation — Prof. A. Kumar, Prof. S. Chaudhuri

- Implemented the **Papoulis-Gerchberg** method for pixel-wise interpolation across the temporal domain
- Investigated the super-resolution of motion vectors considering it as an estimate of physical motion of objects

ACADEMIC PROJECTS

Point Set Registration *Spring 2016*

Application of point set registration techniques to classify dorsal images of fish — Prof. A. Rajwade

- Investigated the performance of techniques like **fast marching, active-contours** for fish segmentation
- Designed algorithm to smoothen the boundary and autonomously place points to efficiently capture curvature
- Evaluated the performance of **Iterative Closest Point** and **Robust Point Matching** algorithms

Inpainting in Microscopy Images *Spring 2016*

Application of inpainting techniques to fill specular holes in microscopy images — Prof. S. Awate

- Implemented and used curvature preserving differential equations for **anisotropic diffusion** of image data
- Explored the use of **non-negative matrix factorization** to learn a dictionary and interpolate values in holes

Brain MRI Segmentation *Spring 2016*

Segmentation of brain MRI into white matter, gray matter, and cerebrospinal fluid — Prof. S. Awate

- Implemented **Fuzzy C-Means** to segment a bias-corrupted and noise-corrupted brain MR image
- Modeled the three components using a **Gaussian Mixture Model** (GMM) and optimized for labels using Expectation-Maximization (EM) algorithm

Spoken Digit Recognition *Autumn 2015*

Recognition of spoken 0-9 digits using mel-filter cepstral coefficients (mfcc) — Prof. P. Rao

- Performed recognition by comparing against a bag-of-frames and **vector quantization** output for each digit
- Improved accuracy by factoring in temporal variability using **dynamic time warping**

Microprocessor Design *Autumn 2014*

Design and simulation of a 6-stage pipelined RISC microprocessor — Prof. V. Singh

- Designed the control unit and datapath for an instruction set, including forwarding and **hazard detection**
- Coded all the components in **Verilog** and performed simulations to verify the design

CO-CURRICULAR ACTIVITIES

IIT Bombay Racing | Junior Design Engineer, Battery Division *Jul 2013 - Jun 2014*

The 70+ member team represents IITB at **Formula Student United Kingdom**, an electric racing vehicle competition

- Achieved a **35% reduction** in weight by analyzing the performance of last year's car
- Implemented **temperature monitoring system** for the battery pack ensuring compliance with standards
- Designed and tested safety circuits for the high voltage battery; integrated it with the rest of electrical system

VideoBucket EDU | App Development Competition *Oct 2013 - Jan 2014*

An educational video consumption platform for Android

- Secured **first position** amongst 158 teams in Aakash tablet app development contest for residents of IITB
- Developed APIs in Java to extend the functionality for data curated using YouTube EDU
- Designed an intuitive UI for navigating courses according to the subject and university

Autonomous Self Balancing Robot | Technical Project *May 2013 - Jun 2013*

A 4-member team project under the umbrella of Institute Technical Summer Project

- Designed and fabricated a PCB which collects data from accelerometer and gyroscope using **I2C** protocol
- Programmed and optimized **PID** control system on **Arduino** micro-controller to actuate the motors

POSITIONS OF RESPONSIBILITY

Institute Student Mentor *Jun 2016 - Present*

Selected on basis of peer review and interpersonal skills as part of a team of 82 mentors from 368 applicants

- **Guiding 11 freshmen** focusing on academic and holistic development, and helping the transition to campus

Teaching Assistant *Jul 2016 - Present*

Part of a 11 member team for Data Analysis and Interpretation, an undergraduate course

- Designed tutorials; proctored exams and graded answer sheets of over 100 students

SKILLS

Programming Android, C/C++, Java, LaTeX, MATLAB, Python (inc. SciPy), SQL, Verilog HDL
Software EAGLE, GNU Radio, Keil Uvision, OpenCV, SPICE

EXTRACURRICULAR ACTIVITIES

- Secured **first position** in basic **Python** coding competition organized by Web and Coding Club, IITB *2014*
- Developed a multi-city cab/auto fare calculator for Android which has **10,000+ installs** *2013*
- Participated in line follower robot competition and wireless controlled robot obstacle course *2013*
- Completed a 5-day trek summiting Kedarkantha Peak, Uttarakhand which stands at 12,500 feet *2016*