Aryan Agal

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Research Interests

Dynamics, Analytical Mechanics, Applied Mathematics, Computational Mechanics, Solid Mechanics, Stochastic Models

Education

Indian Institute of Technology - Bombay, India
Third Year Undergraduate
B.Tech. in Energy Science and Engineering   July 2016 - Present
CPI (Overall) **8.17/10.0** after 3 semesters
Pursuing a minor in the Department of **Computer Science and Engineering**.

Academic Honors

- Awarded **AP**(Advanced Performer) grade for exceptional performance in Computer Programming and Utilization, given to 8 out of 1052 students who registered for the course in the academic year.   *(2016-17)*
- Secured **All India Rank 1960** in **JEE Advanced 2017** among 150 thousand candidates   *(2016)*
- Achieved **99.69** percentile in **JEE Main** among 1.5 million candidates   *(2016)*
- Qualified for the Certificate of Merit in the All India Open Mathematics Scholarship Examination
  twice, for grabbing **61st** and **186th** position in the all India ranklist   *(2011, 2013)*
  Institute for Promotion of Mathematics - IPM

Key Courses

- **Computer Science**   Computer Programming and Utilization, Computer Networks, Convex Optimization*, Data Structures and Algorithms*
- **Mathematics**   Numerical Analysis*, Calculus, Linear Algebra, Differential Equations, Matrix Computations*
- **Energy Science**   Mechanics of Materials, Material Sciences for Energy Applications*, Transport Phenomena*, Thermodynamics, Renewable Energy Technologies*
- **Electrical Engineering**   Electrical Machines*, Electrical & Electronics Engineering, Electrical & Electronics Engineering Lab
- **Others**   Data Analysis and Interpretations, Quantum Physics and application, Basics of Electricity and Magnetism, Economics*, Engineering Drawing

* - ongoing

Key Projects

Smart Mirror   May 2017 - June 2017
Institute Technical Summer Project

- Fabricated a setup for interactive display of day-to-day information on a mirror using a **Raspberry Pi** and an LCD screen. Video and Report.
- Localized and implemented the MagicMirror framework based on **Electron** which is a JavaScript framework, on the RaspberryPi and customized the CSS styling of displayed elements.
- Presented the project as part of the annual **Tech and RnD Expo** of IIT-B

Traffic Light Control System May 2017 - June 2017

Motivated by Self Interest

Transform Maharashtra, a government initiative

- Designed a **traffic handling** system to control traffic lights, taking the number of vehicles present in each entry point of the intersection as input
- Used **image processing** on the live stream from CCTV cameras to analyse the number and density of vehicle movement
- Implemented an algorithm for changing traffic signal waiting times on the basis of number of vehicles per lane.

Enigma - MoodIndigo Express December 2017

Team Creatives

Mood Indigo, IIT Bombay

- Developed an online cryptic clue hunt game, on the **MEAN stack**, with **Monk**, **Jade** and **Sass**.
- Worked on **NodeJS** backend, providing secure **REST APIs** with **CRUD** functions on a **MongoDB** database.

Electronics and Robotics Club Website May 2017 - June 2017

Institute Technical Council

IIT Bombay

- **Developed** a website for club activities and including technical blog posts, tutorials, and event reflections.
- Implemented the website with Jekyll, to make website easier to contribute to, with posts in **Markdown**.
- Setup **auto-deployment** on **TravisCI**, a Continuous Integration provider available in the GitHub marketplace.

Wireless Input for Speaker November 2016

Electronics Club

IIT Bombay

- Created a speaker attachment with an **ESP8266** module, to transmit music wirelessly to the speaker
- Wrote Python code to sample any audio file and connect to the module and stream it over the connection

Main and Beta Websites May 2017 - August 2017

Team Creatives

Mood Indigo 2017, IIT Bombay

- Contributed in development of Main and Beta Websites of Mood Indigo 2017 based on **AngularJS** Framework. Uses **Sass** scripting for styling and **BrowserSync** integration for ease of development.
- Implemented a music player using **angular-soundmanager2** and scroll-based animations using **Skrollr.js**
- Made the beta website cross-compatible through addition of responsive elements to it.

OTHER EXPERIENCE

- **Competitive Coding**
  Applied basic algorithms to solve questions on multiple websites like SPOJ, Codechef, HackerEarth and HackerRank. Currently holds SPOJ rank #**8074** worldwide as of 26th March 2018.

- **Wrestle.AI**
  Developed an **Arduino based bot** acting as a Line Follower, Wall Follower, Maze Path Finder and a wrestler; interfaced the Arduino with an **ultrasound** sensor and self-made **infrared** sensors
- **Client Server Chat Application**   *Course Project, Prof. Mythili Vutukuru*
  Created a **multi-client server program** using concepts of **Socket Programming** in C++ with **epoll**
- **MOOCs**
  Certified, with a **100%** grade in courses of **Neural Networks and Deep Learning**, **Improving Deep Neural Networks**, **Structuring Machine Learning Projects** and **Convolutional Neural Networks**, as part of the **deeplearning.ai** specialization by **Andrew Ng** on Coursera.
- **Hackathons**
  Part of one in top 3 teams of **Microsoft code.fun.do** AI for social Good Online Challenge
- **Android App controlled car**
  Developed a remote controlled car which interfaces with an Android phone using an **HC-05** Bluetooth module

TECHNICAL SKILLS	**Programming**	C++, C, Java, Python, LaTeX, Bash
	Web Development	HTML, CSS, Bootstrap, JavaScript, jQuery, Jekyll, Django, MEAN Stack
	Tools/Software	TensorFlow, Keras, Android Studio, Git, gnuplot, MATLAB, GNU Octave, AutoCAD, Arduino, Raspberry Pi

POSITIONS OF RESPONSIBILITY

Convener, Electronics and Robotics Club   April 2017-Present
IIT Bombay

- Working with a 10 member team, to boost the institute's Electronics & Robotics culture through hackathons, bootcamps, lectures, competitions and group discussions like the upcoming series "How Things Work"
- Organized and mentored in XLR8, participated in by 500 freshmen and mentored 50+ bots in the competition.
- Managed and spoke at a four day spread boot camp on Arduino, Image Processing, PID theory, Basic Electronics, Motors and Raspberry Pi attended by 400 enthusiasts across the institute

Coordinator, Mood Indigo 2017   April 2017-Present
Team Creatives, IIT Bombay

- Web Coordinator for Asia's Largest College Cultural Festival with a footfall of **1.5 lakhs**, hosting **230+** events
- Developing websites, apps, portals for Mood Indigo 2017 that receive over **6.5 million** hits yearly
- Managing a team of over **50 organizers** to conduct and execute events in Mood Indigo 2017

Volunteer, Web and Coding Club   April 2017-Present
IIT Bombay

- Conducting events like hackathons, workshops, reflections, etc. of one of the largest programming clubs in India.
- Assisted in organizing several events, bootcamps and talks including ones on Git, Python and GitHub.
- Monitored 'Seasons of Code' projects in Summer of '17 & cofounded the GSoC Incubation Cell of IIT Bombay

Technical Mentor
from IIT Bombay, for new IIT's

- Mentored students of IIT Goa in their summer-long project, on making a robotic arm.
- Guided students of IIT Dharwad in microcontroller programming, and taught them the basics of Arduino in a hands-on session.

- **Electronics:** Actively took part in many Hackathons, Bootcamps, Talks and HowThingsWork sessions conducted at IIT Bombay by the Electronics Club and made circuits like Xylobands and Audio Amplifiers.
- **Community Work:** Co-organized a diabetes detection camp as part of CURED (Can U Really Escape Diabetes) at the Siddhivinayak Temple premises, Mumbai (a TechFest 2016 initiative).
- **Journalism:** Wrote a part of the article on "Sophomore PoRs", in the Insight Freshman Newsletter, 2017
- **NSS:** Completed a year long course in the National Social Service, while promoting sustainability, organizing cleanliness drives and spreading awareness on going cashless for the ill-informed.