RITIJ SAINI | Curriculum Vitae

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Indian Institute of Technology Bombay   **Mumbai,India**
Dual Degree, B.Tech + M.Tech in Electrical Engineering   *May 2019*

SCHOLASTIC ACHIEVEMENTS

- Pursuing a Minor degree in **Center for studies in resources Engineering**   *Present*
- Ranked in the **top 1%** among **0.2 million** candidates in JEE Advanced 2017   *June'17*
- Achieved a **Percentile of 99.59** in JEE Mains 2017 out of 1.2 million aspirants *April'17*
- Among **top 1%** students at State Level in 5th National Interactive Science Olympiad *Jan'11*
- Selected for Indian National Chemistry Olympiad **(InChO)** from among 40,000+ students *Nov'16*
- Awarded the **10 Grade** in Computer Programming and Utilization (CS-101)   *May'19*
- Among **National top 1%** in National Standard Examinations in Physics and Chemistry *Spet'15*

ACADEMIC PROJECTS

IITB-Proc Microprocessor   *Jan'18-April'18*
Course project under Prof. Virendra Singh | Electrical Engineering Department

- Developed a multi-cycle processor capable of executing 14 instruction sets provided using a controller finite state machine, integrated with the data path along with through test-bench verification
- Implemented a **16 bit** computing system with 8 registers on a & point to point communication
- Designed for an **ISA** based on the computer microprocessor architecture in a optimized way

Digital Voting Machine   *Jan'18-April'18*
Course project under Prof. Subhananda Chakrabarti | Electrical Engineering Department

- Consolidated the operational principles of decoders and logic gates by implementing it on a voting machine with 4 push button activated counters with a master **enable switch** to control four buttons
- Assembled a working circuit with D flip-flops, LM555 timer, decade counters and 7 Segment Display which goes symmetric to the limited IC's displaying vote count after every 2 seconds
- Screened the vote count with 8 second time delay on two 7 segment displays with a delay of 20ms

Elevator Microprocessor Implementation   *May'19*
Course project under Prof. Virendra Singh | Electrical Engineering Department

- Implemented the logic of an elevator using **VHDL** as hardware description language on **Quartus**
- Formulated an algorithm to determine the minimum distance between two floors by **vector function** to decide the movement of elevator under different conflicting condition by same function

Butler Matrix Design and fabrication   *Aug'19-Dec'19*
Guide: Prof. Jayanta Mukherjee | Electrical Engineering Department

- Designed a broadband 4X4 Butler Matrix Circuit using ideal-T lines and verified with micro-strip transmission line at the frequency of 5.4 GHz with combination of 90* Hybrid and phase delay lines
- Passed 3 level simulation- Ideal, Hybrid coupler MLIN elements and Hybrid layout Simulation

Equation Plotter Software   *Dec'17*
Self Learning Project | github.com/ritizsaini/Equation-Plotter-

- Developed a polynomial engine in C++ that could perform all arithmetic operations. Also designed a graph plotter with appropriate scaling factors using simplecpp to solve any general equation
- Software features various sets of functions with capability of determining critical points of graph

Automated Specialized Dispenser   *May'18 - Jul'18*
Summer Technical Project | Student Technical Activities Body

- Designed a **cost-effective, power-efficient** and user-friendly Automated and Specialized Dispenser
- Managed to incorporate functions like automatically sending a safety SMS to authorized vendor on detecting any damage or when stock gets exhausted using **SIM800L** GSM module
- Implemented **Image-processing** techniques in python to recognize the value of coins from webcam using Hough circle feature of **OpenCV library** from the outlines created for the structure scanned

Heart Rate Monitor
Course project under Prof Siddarth Tallur | Electrical Engineering Department   *Feb'19*
- Obtained the pressure wave in blood vessels by the principle of photoplethysmography
- Worked with photosensors active filters to isolate heart rate component of the pressure waves

Processor Pipeline Design
Course project under Prof. Virendra Singh | Electrical Engineering Department   *Aug'19-Nov'19*
- Synthesizing the pipelined processor on FPGA and will demonstrate using SignalTap Analyzer
- Designed, simulated and synthesized a Multi-Cycle RISC processor based on the same ISA

LEADERSHIP & ORGANISATION

Mess Councillor | Hostel 9
(Part of a 3-tier council responsible for managing daily need of 500+ students)   *Aug'19 - Present*
- Supervising the working of Hostel 9 Mess by overlooking an annual bill of over 19 million INR, serving 500+ UG and PG students simultaneously and continuously for 12 months a year processing their basic needs
- **Digitized** the hostel 9 mess by introducing **technological replacements** to conventional methods of cards
- Led the team of 5 member Mess Council who is Responsible for the quality and hygiene of the mess food

Events Coordinator | Mood Indigo 2018
(Asia'a largest cultural festival |200+ events | 139,000 footfall)   *July'18 - Dec'18*
- Spearheaded the negotiations with artists and vendors to curate unique events in the festival of 2018
- Enhanced experience of **0.1 Million+ visitors** & judges by assembling lounges strategically in **550+ acres**

Public Relations Coordinator | E-Summit 2018
(India's largest entrepreneurship promoting body with footfall of 23000+)   *Sept'18 - Feb'19*
- Represented E-Cell in Delhi Haryana for the organization of Eureka **Asia's largest** business model competition encouraging startups all over the nation to come forward and compete under a single roof at E-summit'19
- Played an integral part in organizing workshops and events like Eureka, Illuminate **National Entrepreneurship Challenge** and led listing events like Internship Job Fair**(IJF)** leading and engaging over 85+ colleges

Mess Secretary | Hostel 16
(Part of a 3 tier council to facilitate the management of hostel infrastructure & services)   *Oct'17 - Aug'18*
- Managed the **largest** hostel mess of the IIT Bombay of over **1200+** total residing UG and PG students
- Publicized and conducted Solside Institute's **largest** hostel fest with an annual budget of **INR 0.2 Million**

TECHNICAL SKILLS

- **Programming Languages:** C/C++, Python, LaTeX, VHDL, HTML5, JavaScript, SQL, Matlab, CSS, MySQL
- **Software:** AutoCAD, SolidWorks, NGSpice, Origin9, GNU plot, Xcircuit, Photoshop, Premier Pro, After effects, Lightroom, InDesign, LTSpice, Git, UrJTAG, ModleSim, git, GNU Radio, Keil, Jupyter, Anaconda
- **Electronic Devices:** Arduino, XBee, Mbed, Quartus, Raspberry Pi 3, Micro-controller (AVR)

EXTRA-CURRICULAR

- **Volunteer | National Service Scheme**   *July'17-Dec'17*
  -Worked in the "Events" department, that explores the avenues of sustainable development and in Ideation and implementation of solutions to social problems comprising as much as **80 hours** of social service
- **Mood indigo Interview-AfterMovie**   *March'18*
  -Achieved **0.1M+ views** , **1.5k+ likes** and **100+ comments** on YouTube solely based on organic reach

KEY COURSES UNDERTAKEN

Electrical Engineering	Microwave Integrated Circuits†, Microprocessor†, Communication systems†, Electromagnetic waves†, Digital systems, Analog Circuits, Power electronics, Signal and Systems, Networks theory, Electronic devices and circuits, Microelectronics
Mathematics	Probability and random process† , Data Analysis and Interpretation, Linear Algebra, Differential Equations, Complex Analysis, Multi-variable and Vector Calculus
Other Key courses	Remote Sensing and Image Processing† , Sociology† , Quantum Physics Biology and Bio-engineering , Physical Chemistry, Organic and Inorganic Chemistry , Engineering Drawing

† represents to be completed by November 2019