



Ritesh Kumar
Electrical Engineering
Indian Institute of Technology Bombay
Specialization: Microelectronics

15D070033
Dual Degree (B.Tech+M.Tech.)
Male
DOB: 04/03/1997

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2020	0.00
Intermediate/+2	Delhi Public School, Bokaro	DPS	2014	90.40
Matriculation	DAV Public School, Urimari, Hazaribagh	DAV	2012	10.00

WORK EXPERIENCE AND SURVEY

Edelweiss Securities Limited, Mumbai

Institutional Equities - Trading Technology Team

SUMMER

[May '18 - July '18]

- Designed UX and UI for easy access to Transaction Cost Analysis(TCA) report to help traders get actionable insights to enhance and synchronize trading related execution quality, compliance and management
- Implemented login authorization, dynamic forms to query single day and multiple day TCA reports based on date, account ID, portfolio and instrument with download link to summary file on Django framework
- Created infrastructure for logging errors, warnings and regular django server information

WINTER

[Dec '17]

- Reviewed and reengineered the code base for plotting transaction execution graphs using python
- Introduced features like embedding the volume traded, hover for more details and colour schemes for different algorithms to help traders compare their performance with the market more efficiently

PV Module Field survey, Leh

[June '19]

NCPRE, IIT Mumbai

- Collaborated with 2 others in PV module survey of 7 days to inspect plant installations and performance degradation
- Surveyed 88 modules at 3 sites in Laddakh region and carried out module and string level I-V characterization, IR thermography to detect hotspots and visual imaging to capture cracks on the cells
- Calculated average performance degradation rate per year to be 1.42%, 3.32% and 3.97% using MATLAB

Teaching Assitant

[June '19]

Instructor: Prof. Narendra Shiradkar, EE dept. IIT Mumbai

- Developed an online portal for 40+ students to access personalized random failure data of devices and predict the nature of failure
- Generated artificial random data for normal, weibull, lognormal and exponential distributions with varying parameters

RESEARCH AND COURSE PROJECTS

Degradation rate determination of solar plant — *M.Tech Thesis*

[June '19]

Guide: Prof. Narendra Shiradkar, EE dept. IIT Mumbai

- Aiming to use data science to perform predictive analysis of reliability of solar modules
- Creating models for solar cells to determine the dependency of parameters on degradation rate
- Implemented single diode model with five parameters for solar cell on python
- Processed module datasheet values to extract the 5 parameters and solved ideal diode equation.
- Implemented five parameters single diode model for solar cell by extracting the parameters from module datasheet and implicitly solving ideal diode equation using python
- Used Bokeh server to plot the I-V curve interactively with parameters sliders for all five parameters
- Keywords to add : predictive analytics, data science, pv performance, modelling and simulation, reliability,

Solar module mounting orientation and axis tracking effect

[Mar '19 - May '19]

Course : Design and evaluation of PV power plants

- Determined the best possible orientation of solar panel for maximum power output in different regions.
- Performed parametric analysis on System Advisor Model software by varying tilt and azimuthal angle in northern, southern and equatorial regions for summers and winters.
- Concluded that optimal tilt angle is latitude angle and optimal azimuth is 180 in north and 0 in south
- Observed for equatorial regions optimal azimuth angle changed seasonally and axis tracking was effective

Image compression using wavelet transform algorithm

[Mar '19 - May '19]

Course : VLSI Design Lab

- Implemented image compression algorithm using 4-taps, 2-D Daubechies Wavelet Transform on 512 x 512 grayscale image and reconstructed the image using Inverse Daubechies Wavelet Transform
- Implemented whole system on Cyclone IV-E Altera FPGA using Nios II processor in platform designer interfaced with SDRAM module on-board which is capable of storing input and output image data of large sizes
- Applied low pass and high pass filtering followed by downsampling by 2 on rows and columns sequentially to obtain LL, LH, HL and HH image components
- Implemented thresholding on image and performed Huffman encoding to obtain compressed image data which is decoded and then reconstructed back

Power Amplifier design

[Mar '19 - May '19]

Course : Solid State Microwave devices

- Simulated a 2 stage power amplifier with matching & bias T circuits with unilateral design approach in ADS
- Designed, fabricated & tested the PCB using Vector Network Analyzer for gain and bandwidth specifications

Modelling gesture control

[Oct '18 - Nov '19]

Course : Sensors in Instrumentation

- Modelled 3-D Gesture Control using ADXL345 Digital Accelerometer interfaced with Arduino board
- Estimated inclination angle of the three axes with an error of less than 5% and plotted the same in real time

IITB-RISC Microprocessor design

[Oct '17 - Nov '17]

Course : Microprocessors

- Designed a 16-bit system with 8 registers having multi-cycle point to point communication infrastructure
- Synthesized VHDL code integrating the controller-FSM and data path for FPGA demonstration

Portable Solar cum Vibration Energy Harvesting Mobile Charger

[Oct '18 - Nov '18]

Course : Electronic Design Lab

- Designed a suitable AC-DC converter and a DC-DC Boost converter for vibration and solar circuit output
- Prototyped and tested working model of the charger with optimized size and performance

POSITIONS OF RESPONSIBILITY

Campaigning Coordinator

[2016]

Abhuydaya, Social Body IIT Mumbai

- Led volunteer weekends at various schools for the underprivileged with a unified motive of circulating general awareness, computer basics and career counselling, with a team of 20-22 members
- Headed a 23 member volunteer team to HUMARA BACHPAN (National level initiative for children enforcement) in Bhajiwali slums, with a purpose of realizing the harsh situations of kids
- Co-ordinated and volunteered ANTARCHAKSHU, St. Xaviers XRCVC's initiative demanding the government and the general people full and equal accessibility for the visually challenged science education

Services Coordinators, Mood Indigo IIT Mumbai

[December 2016]

Asia's largest College Cultural Festival, with a footfall of 130,000+, 160+ international artists

- Worked with a team of 30 to facilitate the smooth functioning of other departments in Mood Indigo '16
- Supervised the execution and logistic requirements of 4 major concerts handling a 15000+ crowd

TECHNICAL SKILLS

- Python and it's libraries like pandas, numpy, plotly, bokeh, dango framework
- C++, MATLAB, VHDL, deign tools : Cadence Virtuoso, Quartus

RELEVANT COURSES UNDERTAKEN

- **Solar and Reliability** : Design and evluation of PV Plants, Reliability and Failure Analysis of Electronic Devices
- **Analog VLSI** : CMOS Analog VLSI Design, Mixed Signal VLSI Design, RF Microelectronics Chip Design
- **Others** : Data Structure and Algorithms, Probability and Random Processes, Intro to Quantum Mechanics

EXTRA CURRICULAR ACTIVITIES

- Acheived Black belt (1st Dan) in Shotokan style Karate after regular training of 4 years
- Bagged silver medal in the Street Play competition, Freshiezza (Freshmen cultural competitions)
- Member of Gold medal recieving squad in Badminton General Championship amoung 12 hostels 2018
- Pursuing 50 hours official German language course provided by International Relation Cell, IIT Mumbai