

# Vaibhav Krishna

3rd Year Undergraduate Student

Department of Electronics and Electrical Communications Engineering

Indian Institute of Technology Kharagpur

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## EDUCATION

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### Indian Institute of Technology Kharagpur

July 2016 – April 2020

B.Tech in Electronics and Electrical Communication Engineering

GPA 9.78/10.0, Department rank 3

### JVM Shyamli, Ranchi

May 2016

All India Senior School Certificate Examination (AISSCE), CBSE board

Percentage score 93.6

### Surendranath Centenary School, Ranchi

May 2014

All India Secondary School Examination (AISSE), CBSE board

GPA 10/10

## RESEARCH INTERESTS

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The broad area I am interested in working is Analog and Digital VLSI circuits. I am particularly interested in current research work going on in the field of low-power Wearable/Implantable Devices for Biomedical Applications, Mixed-signal circuits for Edge computing, and development of new novel devices for various exciting applications. I am deeply passionate about working with people from the academia on circuits targeted towards emerging applications and aspire to pursue a full-fledged career in this domain in the future.

## WORKSHOPS

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### VLSI Summer School

May 2018-June 2018

Attended the six week VLSI summer school organised by IIT Kharagpur where we were acquainted with several interesting theoretical aspects accompanied by hands-on simulations related to various aspects of VLSI such as low power analog frontend design for a neural interface, digitally calibrated analog design and ADC design. We were also introduced to new and emerging fronts like edge computing, approximate computing, VLSI for neuromorphic computing and more through various Guest Lectures by professors from different universities and professionals in the industry.

### Winter Workshop

December 2017

Attended the three-week long Winter workshop organised by Prof. Mrigank Sharad. Various topics including some basic Machine learning algorithms like Neural network and k-means clustering, FPGA architecture, coding in Verilog HDL and brain-inspired computing were discussed.

## PROJECTS

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### Electromagnetics of capacitor and inductors

March 2018

Advisor- Prof. Arijit De

The first part of this project involved modelling finite dimensional parallel plate capacitors. This part was coded in Matlab, and it involved calculating charge distribution on the plates using numerical integration and finding the electrical field strength between the plates and outside the plates to observe the fringing effects. The second part of the project involved finding mutual inductance of two current-carrying coils whose axes were shifted by finite length. This part was also coded in Matlab and required the application of Neumann Formula in its numerical integral form.

## Implementation Of State Variable Approach in Network Analysis

November 2017

Advisor- Prof. Arijit De

Based on the concept of Normal Tree provided in "The State-Variable Approach to Network Analysis" By E S Kuh and R A Rohrer and using state space analysis a circuit simulator for a linear time-invariant circuit having lumped elements(R, L, C) was implemented. The project involved treating the circuit as a graph and using the Minimum Spanning Tree algorithm to find the Normal tree. The whole project was coded in Matlab.

## Simulating Semiconductor devices phenomenon using nanoHUB

September 2017

Advisor- Prof Mrigank Sharad

Using nanohub.org's ABACUS(Assembly of Basic Applications for Coordinated Understanding of Semiconductors) tool, the complex physical phenomenon at the sub-atomic level taking place inside semiconductor devices like PN junction diode, BJTs and MOSFETs were analysed. Observed plots capturing essential device characteristics like energy band diagrams, electric field and electric potential profiles, charge carrier concentrations and I-V characteristics and studied their respective dependencies on important parameters like doping concentration, the rate of generation recombination of carriers and temperature.

## SKILLS AND EXPERTISE

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**Programming Languages:** Matlab, Verilog HDL, Python, C

**Software Packages:** LTspice, Orcad PSPICE, Xilinx ISE

## RELEVANT COURSEWORK

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Analog Electronic Circuits	Digital Electronic Circuits	Advanced Semiconductor Devices
Network Theory	Signals And Systems	Probability and Stochastic Processes
Electromagnetic Engineering	Matrix Algebra	Analog Communications

## ACADEMIC HONOURS AND AWARDS

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<b>Department Change</b>	2017
Successfully accomplished a department change to E&ECE	
<b>Joint Entrance Exam (Advanced)</b>	2016
Among the Top 0.1 percentile (AIR 935) out of the 150,000 candidates	
<b>Kishore Vaigyanik Protsahan Yojana (KVPY)</b>	2016
Awarded fellowship in the young scientist program (KVPY) conducted by IISc Bangalore	
<b>National Standard Examination in Physics</b>	2016
Qualified for the Indian Physics Olympiad after bagging 4th position in the State of Jharkhand	
<b>National Standard Examination in Chemistry</b>	2016
Qualified for the Indian Chemistry Olympiad after bagging 1st position in the State of Jharkhand	
<b>0.1% Merit Award CBSE</b>	2016
Awarded in Physics for exceptional performance in the subject in AISSCE	

## EXTRA CURRICULAR ACTIVITIES

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Vice Captain OF RK hall Quiz team

Acting as Mentor for freshmen under the aegis of Student Mentor Program organised by SWG, IIT KGP. Bagged the first position in General Quiz organised by IIT KGP Quiz club as a part of their Quiz Week. As a part of The KGPian Game Theory Society organised many events to Promote Game Theory on Campus.

Runner-up in the National Science Day Quiz-2012 conducted by Kendriya Vidyalaya Sangathan.