Saurabh Suryavanshi | **08D07037**
Electrical Engineering | **Dual Degree (B.Tech+M.Tech.)**
Indian Institute of Technology, Bombay | **Male**
Specialization: Microelectronics | **DOB: 28/09/1990**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2012	9.47
Intermediate/+2	Pune	R.Y.K. Science College	2008	91.00
Matriculation	Pune	A.P.Patel High School	2006	85.23

SCHOLASTIC ACHIEVEMENTS

- **Dept. Rank 1** (out of 48) for 09' and Rank 2 for 10' and 11'; Academic Excellence Award for 3 consecutive years
- All India Rank 264 (IIT-Joint Entrance Examination)
- **State Topper** in AIEEE, High School Mathematics, Maharashtra Common Entrance for Engineering Math
- **Scholarships:** National Talent Search (top 1000), AIEEE Merit Scholarship (top 350), Maharashtra High School Scholarship, IIT Bombay Heritage Fund (10 % students)
- Among **top 1%** for International Astronomy Olympiad, secured All India Rank of 72 in National Cyber Olympiad
- Was Head Boy of School; adjudged best student **for all round performance** in school
- *Minor Degree* in Energy Sciences with CPI of 8.8

RESEARCH INTERNSHIPS

CARNEGIE MELLON UNIVERSITY, PITTSBURGH, USA [May 11' to July 11']

Trojan Detections in FPGAs, Guide: Prof. Shawn Blanton, Director CSSI

- Implemented an ingenious idea to test hardware for malicious trojans in Xilinx FPGA
- Achieved 100% detection of trojans embedded on interconnects; co-related the data with Xilinx path simulator
- Proposed an automated method to check for entire FPGA using architecture symmetry & in phase of publication

CENTER FOR EXCELLENCE IN NANOELECTRONICS (CEN, IIT BOMBAY) [May 10' to July 10']

Energy Harvesting Using Nano Antennas, Guide: Prof. Maryam Shojaei, IIT Bombay

- Provided a thorough analysis of cutting edge technologies for energy harvesting applications
- Fabricated and characterized MIS devices for high frequency application

KEY ACADEMIC PROJECTS

APPLICATION OF PHOTONIC CRYSTAL TO THIN FILM SOLAR CELLS MASTER'S THESIS

- Targeted 5% increase to present standard in solar cell efficiency using photonic properties of increase absorption
- Employed L9 array Taguchi method to optimize silicon nanowire design with four parameters having nonlinear relationships; supported the data with physical device understanding

BAGASSE OPPORTUNITY IN JAGERRY MANUFACTURING CTARA, IITBOMBAY

1st prize by Eaton *for Industry Defined problem at Helios (IIT Bombay National Level Energy Competition)*

- Surveyed 100+ Entrepreneurs from Kolhapur and Daund; visited jaggery manufacturing plants to compare the process efficiency from Pune, Kolhapur & Belgaum
- Conceptualized an ecosystem to utilize bagasse from jaggery plants & proposed to Superintendent Officer of Agriculture (Kolhapur) a co-operative model with additional income of INR 2 lakhs per entrepreneur

ELECTRONIC DEVICE LABORATORY

Designed to remotely control an electronic device using SMS service

- Developed a system to decode messages using AT commands and python script running on central server; the information was transferred along a modeled power line to the target device
- Established serial communication between server and device on other end of modeled power line.

REVIEW PAPER ON MULTIJUNCTION AMORPHOUS SILICON SOLAR CELLS

Under guidance of Prof. Vikram Dalal, Iowa State University, USA

- Investigated current and past research covering various aspects of multijunction thin film a-Si/Nano-Si solar cells
- Compiled a comparative summary of evolution of fabrication technologies and efficiency over last decade

MICROELECTRONIC PROJETCS

90nm MOSFET DEVICE MODELING : Modeled a n-channel MOSFET using Sentaurus process and device simulator based on Intel's state-of-art 90 nm node design rules & achieved excellent device characteristics matching the parameter values as published in the paper

OP-AMP: Designed a differential Op-amp in UMC 0.18µm technology using Cadence to achieve a minimum settling time of 0.5% and power 10mW

Built a Differential amplifier using **discrete devices** (BJT) with an open loop gain of 10000

POWER ELECTRONICS: Developed process for UMOSFET and DMOSFET to get V_T of 4 Volts and breakdown of 100 Volts. Compared temperature dependence on leakage current, break down voltage and On-resistance.

TEST PATTERN GENERATION FOR COMBINATIONAL CRICUITS: Implemented *D-algorithm and PODEM*, Used ISCAS netlist, implemented observability and controllability to simply **recursive backtracking** & calculated fault coverage

PULSE WIDTH MODULATOR (PWM): Used discrete digital ICs to implement PWM with external input to change duty cycle

SKILLS

Programming/Languages : C/C++, Python, Scilab, Matlab, Blue spec, Verilog, VHDL
EDA tools : Sentaurus, Lumerical, Magic, NG Spice, Eagle, Origin, Keil, Ansys, Xilinx ISE
Microcontroller : AVR-Atmega family, Intel 8058 series

TEACHING EXPERIENCE

MICROELECTRONICS SIMULATION LAB: Designed Assignments to test for proficiency in process and device simulation

BASIC CHEMISRTY: Facilitated special batch of weak students by way of regular tutorial sessions and assignments

LEADERSHIP EXPERIENCE

GENERAL SECRETARY, HOSTEL 8 [June 12' to Present]

Elected to lead a 3-tier council of 29 students to represent 340 residents of hostel 8

- Negotiated mess contract with annual budget of INR 50+ lakhs, reorganized its working to suit student's expectation, and introduced reforming fine rules to maintain accountability of contractor
- Initiated renovation of Recreational hall, construction of Basketball court and development of boxing room totaling INR 9 lakhs
- Implemented first ever Laundromat Project in IIT Bombay in co-ordination with Student Alumni Relationship Cell and pitched new projects for hostel in front of 20 IIT alumni

INSTITUTE STUDENT MENTOR (Institute Student Mentorship Program) [May 10' to Present]

Selected from 380 student applicants on basis of sound overall performance

- Responsible for mentoring 12 freshmen, helping them adjust to life in college and counseling them on key academic and extra-curricular issues
- 1 among 20% Institute mentors to be made mentor for **2 consecutive years**

CAPTAIN - HOCKEY [08', 09' and 12']

- Led the hockey team in First year (*Silver* – 6 teams), sophomore year (*Gold* – 9 teams) & Captain Hostel team
- Instrumental in creating conducive environment for development of hockey in hostel

WARDEN NOMINEE *(Administrative Head, Hostel 8)* [July 11' to May 12']

- Evaluated council's performance on regular basis, headed appraisal committee (40 members) to decide awards across 4 genres

EXTRA CURRICULAR

AWARDS: Hostel Organization Special Mention, Performing Art Festival - Colour and 2 Special mentions (Productions)

SPORTS:

- 4th place in hockey at Annual **Inter-IIT Sports** meet (December 2011); Silver ('09 &'10) at Inter-hostel Championship
- Represented IIT Bombay at Bombay Hockey Association League and Inter University Tournament (West Zone)

CULTURAL:

- Part of dance team to perform at gyrations (inter hostel dance competition); Stood 4th (pool of 13 teams)
- Performing Arts Festival: Acting (10' and 11'); Incharge (Productions) – part of 2-tier team of 40 students to build and designed award winning set

OTHERS:

- Interested in Energy and Environmental Politics; written a course paper "Environmental politics: BASIC vs. West"
- Conducted Energy Audit of printing press of IIT Bombay
- Beginner in Spanish (completed 50 hours of lectures), Avid trekker