Jyoti Martoliya
Energy Science and Engineering
Indian Institute of Technology, Bombay

193170023
M.Tech.
Gender: Female
DOB: 02-02-1995

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2021	7.92
Graduation	UTU	GBPEC	2015	73.40%
Graduation Specialization: Electrical Engineering				
Intermediate	CBSE	New Beersheba	2011	81.80%
Matriculation	CBSE	JNV	2009	88.60%

MASTER'S THESIS

Thermal characterization of silicon carbide (SiC) MOSFETs [May '20 - Present]

[M.Tech. Thesis | Guide: Prof. Pavan Kumar Hari | Dept. of Energy Science and Engineering, IIT Bombay]

- Reviewed the literature on **thermal models** and methods to evaluate thermal model circuit parameters
- Designed a circuit to carry out the **thermal characterization** of SiC power MOSFETs
- Performed analytical calculations for the power dissipated by SiC switches and **selected heat sink**
- Predicting **temperature rise-time** with different heat sinks and estimating **thermal capacitance**
- Designing the **thermal model** for the case of multiple devices attached to the same heat sink

Future Work

- Design of **auxiliary circuits** in the experimental set-up and selection of temperature measurement device
- Experimental investigations to validate the thermal model in terms of **transient and steady-state temperature rise** considering two conditions, individual heat sink per device and single heat sink for multiple devices

ACADEMIC PROJECTS AND SEMINAR

Modeling and Simulation of variations in Electrical Torque on grid-connected Synchronous machine under high RE Penetration[#] [Aug '20 - Nov ' 20]

[Course Project | Instructor: Prof. Zakir Hussain Rather | Dept. of Energy Science and Engineering, IIT Bombay]

- Reviewing the literature to analyze different topologies of **RE-integrated power system** existing in real-time situation and developing the **synchronous generator torque model** with respect to the change in the existing grid system
- Planning to derive empirical relation between **electromagnetic torque and change in frequency** followed by further validation through simulations

Thermal Modelling of power semiconductor devices [Jul '19 - Nov '19]

[M.Tech. Seminar | Guide: Prof. Pavan Kumar Hari | Dept. of Energy Science and Engineering, IIT Bombay]

- Studied different modes of heat transfer and their representation in the **equivalent electrical circuit**
- Identified the issues related with compact size and excessive junction temperature rise of power semiconductor devices
- Analyzed the requirement of the **thermal model solution** in power electronics devices
- Assessed the thermal model with the **device rating**, which provides **flexibility to design** and optimize the efficiency

Feasibility study of digital notice boards in IIT Bombay [Jul '19 - Nov '19]

[Course Project | Instructor: Prof. Rangan Banerjee | Dept. of Energy Science and Engineering, IIT Bombay]

- Compared printed media and digital screens on the basis of **cost, energy consumption, and environmental impact**
- Performed **cradle-to-gate analysis** of digital media and print media for life-span of **10** years
- Estimated annual monetary savings of **₹ 6 lakh** and energy savings of **12000 kWh** with an increase in CO_2 emissions by 3 tonnes, by replacing printed media with **20** digital screens across the campus

Fault zone detection using discrete wavelet transform (DWT) and support vector machine (SVM) as classifier [Jan '15 - May' 15]

[B.Tech. Thesis | Instructor: Prof. Y. Kumar | Dept. of Electrical Engineering, GBPEC]

- Identified the issues related to the presence of series capacitor in fault circuit and **fault zone identification methods**
- Generated **100** faulty datasets in **MATLAB** for midpoint series compensated line by varying system & fault parameters
- Detected fast technique by applying **DWT** for feature extraction and **SVM** as a classifier for fault zone determination

Status of technology & opportunities of hydrogen in industrial sector in Africa [Jan '20 - Jun '20]
[Course Project | Instructor: Prof. Pratibha Sharma | Dept. of Energy Science and Engineering, IIT Bombay]
- Reviewed and studied various **hydrogen production techniques** and the overall industry structure for the feasibility of incorporating hydrogen in Africa
- Reviewed **government policies and projects** hinting towards hydrogen economy

INDUSTRIAL TRAINING

Cetpa Infotech Pvt. Ltd., Dehradun | Trainee [Jun '14]
- Underwent **four** weeks of summer training on programmable logic controllers **(PLC)** and Supervisory control and data acquisition **(SCADA)**
- Familiarized with Allen Bradly PLC's **RSLogix 1000** and Wonderware Intouch SCADA

SOFTWARE SKILLS

Programming Languages/ Libraries	: Python, C, C++, Matplotlib, Pvlib, Numpy, Pandas
Softwares/Tools	: MATLAB Simulink®, System Advisor Model-NREL, PLECS
Visualization Tools	: Inkscape, MS Office, LaTeX

RELEVANT COURSES AND KEY LEARNINGS

Microprocessor Application in Power Electronics[#]	: Implementation of **TMS320F28379D processor** based control system
Power Electronics	: PWM & SVM techniques, DC-DC and DC-AC converter, filter design
Renewable Energy Integration[#]	: **Grid Integration of EVs**, solar PV and wind power plant, Grid codes
Electric Drives[*] [#]	: Motor drives, VSI and CSI fed induction motor drive, V/F control
Design and Evaluation of PV Plants	: Modeling, Monitoring, and Performance assessment of PV plants
Energy System Modeling and Analysis	: Constrained Optimization, **Regression analysis**, Input-output Model
Non-Conventional Energy Sources	: Solar Photovoltaic conversion, Solar Radiation, Wind Energy
Energy Management	: **Energy Auditing**, Demand-side management, Energy Economics
Control Systems	: Time response, frequency response and stability analysis of system
Introduction to Entrepreneurship[#]	: Evaluation and Impact of Entrepreneurship on business and society

POSITIONS OF RESPONSIBILITY

Trainer, Student Solar Ambassador Program | SoULS, IIT Bombay [Oct '19]
- Contributed as a trainer in a 1- day solar lamp assembly event in IIT Bombay
- Responsible for training of **25+** students to assemble & test solar urja lamp on Mahatma Gandhi Jayanti

Teaching Assistant | Department of Energy Science & Engineering, IIT Bombay
- **EN 420, Energy Laboratory II** [Jan '20 - Jun '20]
  - Mentored and guided **14** M.Sc. 1st Year students in conducting experiments in the basic electrical domain
  - Introduced the students to the basic concepts of digital electronics and assisted in drafting the lab manual
- **EN 313, Power Electronics** [Aug '20 - Present]
  - Assisting professor in grading assignments for **40+** 3rd-year dual degree students

Volunteer | E-convocation, 2020 [Aug '20]
- Worked in close collaboration with the Department Council, Dept. of Energy Science & Engineering, IIT Bombay in conducting the e- Convocation 2020

ACHIEVEMENTS AND EXTRACURRICULAR ACTIVITIES

- Secured **1st** position in **Intercollegiate Volleyball Tournament** [Sep '14]
- Qualified for **semis** among **18+** departments in Girls Table Tennis, **PG General Championship** [Oct '19]
- Completed **10** days crash course in Energy organized by Energy Club, IIT Bombay [Aug '20]
- **Online Course: Foundations of Data Science**[#], offered by One Fourth Labs [Aug '20]
- Participated in **Regional level Volleyball Meet** held at JNV, Faizabad (UP) [Sep '06]

HOBBIES

- Nature photography & gardening
- Playing Volleyball, Table-Tennis, and Badminton

[# : Ongoing] [* : Audit]

Scholastic achievements and extracurricular activities are not verified by the Placement Cell