Shreyas Dethe

Bachelor of Technology, Electrical Engineering
IIT Bombay, Class of 2020

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Aspiring Power Electronics Engineer, interested in High Power-Density circuits, Power Converters, Battery Technology, Electric Vehicles.

WORK EXPERIENCE

Boson Motors, Pune, India— *Power Electronics Intern*

MAY 2019 - JUL 2019

Design, development, prototyping and testing of *high-frequency driver circuits* for the newer generation SiC MOSFETs, switching at 100 kHz. These circuits were an integral part of the on- and off-board charging systems for Lightweight Commercial Electric Vehicles. Design also included auxiliary circuits like snubber and short-circuit protection.

PROJECTS

High Power Density DC-DC Converter using DAB topology

with Prof. Anshuman Shukla, Dept. of Electrical Engineering, IIT Bombay

AUG 2019 - APR 2020

Designed a **2 kW DC-DC Power Converter** using DAB topology with single phase-shift modulation, mainly intended for chargers for electric vehicles. Design used the newer SiC MOSFETs as the main switches and implemented closed loop control for the output voltage in the range 350-450V.

Low-cost Potentiostat-Galvanostat and Battery Cycler

with Prof. Srini Ramakrishnan, Dept. of Chemistry, IIT Bombay

MAY 2021

Design, development and testing of a low-cost combined potentiostat-galvanostat using off-the-shelf components. To be used for cyclic voltammetry, ammetry and electrochemical impedance spectroscopy.

EDUCATION

Indian Institute of Technology, Bombay, India

Bachelor of Technology

JUL 2016 - APR 2020

CPI: 6.76/10

Key courses taken: Power Electronics, Microprocessor Applications in Power Electronics, Sensors in Instrumentation, Electrical Machines, Electronic Devices and Circuits, Analog Devices/Circuits and Lab, Microprocessors and Lab

SKILLS

Electronic Circuit Design, PCB Design, Circuit Simulation, C, C++, MATLAB, Python

LANGUAGES

English, Hindi, Marathi (Advanced)
Spanish (Beginner)

AWARDS

Achieved first prize in a group of three in the competition **I-Hack**(Hardware Track) held at E-Summit 2019, IIT Bombay, January 2019.

Awarded **Tech Person of the Year** by Technical Council, Hostel 9, IIT Bombay, 2018-19

Achieved third position, in a group of four in both the competitions **PlutoX Hackathon** and **TCTD Challenge**, in the 7th Inter-IIT Tech Meet, December 2018 held at IIT Bombay

EXTRAS & HOBBIES

Front-end web development (HTML5, CSS3, JavaScript),

NodeJS, ReactJS, p5js

UI/UX Design, Adobe Illustrator, Photography

PROJECTS (continued)

Analog front-end development for NavIC receiver

with Prof. Shalabh Gupta, Dept. of Electrical Engineering, IIT Bombay

MAY 2018 - APR 2019

Optimised a previously developed analog front-end receiver for the satellite system NavIC - **Nav**igation within the **I**ndian **C**onstellation. Implemented a method for faster computation of correlation data taken from the received signal and complete acquisition of at least four satellites.

Multiple Drone Tracking and Localization

with Drona Aviation (dronaaviation.com)

DEC 2017

Localized multiple drones' position using the WhyCon ROS package and extracted 3D coordinates of multiple drones in real-time with accuracy up to 3cm. These coordinates were later used in a project to automate drone's flight movement based on its past location. Developed a way to control a swarm of drones using the Master-Slave topology and specific IP addresses provided to individual drones, using the ESP8266 WiFi module.

Automated Strawberry Plucker

TCTD Challenge, Techfest 2018, IIT Bombay

DEC 2018

The challenge provided by Tata Center for Technology and Design (TCTD) was an open problem, to provide the farmers of India an automated solution that would reduce manual labour. (In a group of four) Designed an automated strawberry plucker, a four wheeled bot that goes over a strawberry plant, rotates its arm around until it sees a strawberry, plucks it using a gripper and places it in a collection basket. Strawberry detection and classification was done using computer vision and Yolo V3 single-shot object detector, with the Raspberry Pi camera. Controls were implemented using Arduinos, a stepper motor and a multitude of servo motors.

Faster computation of correlation of NavIC data

Knowledge Incubation under TEQIP, MHRD, Govt. of India

APR 2019

Developed an algorithm for faster correlation of local data received from a NavIC receiver. The method involved moving from the traditional linear search to the circular search algorithm, which in the frequency domain translates to the fourier transform. Computing FFT (Fast Fourier Transform) is a relatively computationally inexpensive task, hence the overall computation time for correlation is reduced by 7000%, in our MATLAB implementation. This faster correlation process will reduce the cold-start time of future NavIC receivers.

Reading Device using Braille

Institute Technical Summer Project, IIT Bombay

JUL 2017

Designed and developed a device which provides dynamic tactile Braille-character output aided by electro-mechanical systems under the users finger while receiving input from any document pre-loaded. It uses a Raspberry Pi for processing and output. It was designed to help visually challenged people to read any PDF document using the Braille character system.