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Profile

I have done 4 internships, 6 projects and won 2 competitions (eYantra and Instructables) during my 4-year B.E course. I have also conducted 2 workshops and organized a circuit debugging competition

I am a water sports enthusiast having self-learnt windsurfing. I am also a PADI certified advanced open water SCUBA diver. All my work is collated on my website chiragrshah.com

Education

2015 – 2019	Currently in the final year, Electronics Engineering Sardar Patel Institute of Technology	8.18 CGPA (Up to Sem 7)
2015	HSC - Maharashtra State Board PACE Junior Science College, Dadar	82.31%
2013	SSC - Maharashtra State Board St Xavier's High School, Fort	87.5%

Internships

ideaForge: Design & build of Engineering Validation Prototype (10/Dec/2018 – 18/Jan/2019)

6 weeks internship at ideaForge Technology Pvt. Ltd; a pioneer in the Unmanned Aerial Systems segment in India

- Along with my mentor, I designed the prototype, created the CAD model on Fusion 360, fabricated and assembled the parts. To build this custom prototype I had to 3D print some of the parts
- I designed and built the electronics setup to drive the mechanical assembly

eYantra: Formation Control of Multiple Swarm Robots (22/May/2017 - 7/Jul/2017)

7 weeks residential internship at the Embedded and Real-Time Systems Lab under Dr Kavi Arya, IIT Bombay under the eYantra Summer Internship 2017 program

- I explored algorithms to control groups of robots and make different swarm formations
- Developed the embedded C program for the swarm robots (ATmega-16)

Fractal Analytics: Implementation of Room Occupancy System (11/Jun/2018 - 13/Jul/2018)

Implemented the system across 9 meeting rooms. Understood what it takes to implement a system in real life which is running 24x7 v/s building a prototype

- The devices were designed to consume very low standby current for battery operation
- The devices connected to each other via a network of RF trans-receivers
- Data was sent to AWS IOT core and then pulled into dynamo DB for storage

Fractal Analytics: Hololens Experience (27/Nov/2017 to 5/Jan/2018)

We developed an application for the Microsoft Hololens. One can interact with the products kept on the holographic shelf and then see the analysis in the form of holographic pie charts, bar graphs, and heat maps

I learnt to translate a business need, get it to life in a system and derive business value

We developed 3 use cases

- Share of Sight Analysis (which shelf/products receives the most attention)
- Share of Shelf and Share of Rack analysis (share of brand/products on the shelf)
- Compliance (are retailers complying with their agreements for product display with the manufacturers)

SPIT - 3 weeks summer training program on Embedded Systems Design held in June 2016

Projects / Achievements

Tethered Multirotor - Ongoing BE final year project

We are working with Drishti Works; a startup based in Mumbai for our final year project. Our aim is to develop a tethered multirotor with an AUW (All Up Weight) of 10 kgs

The key issue with a tethered multirotor is that it requires very high current and the cable thus required becomes very bulky and heavy. To solve this we are developing a High Voltage DC system (HVDC) which will reduce the transmission current. Currently, we are developing the step-down module which will be on board the drone (130V DC => 32V DC @ 20A)

We performed a successful 70 min continuous and semi-autonomous flight at the end of semester VII

e-Yantra Robotics Competition 2016: 1st Place

e-Yantra is an initiative to spread education in Embedded systems and Robotics by **IIT Bombay, sponsored by Ministry of Human Resource Development**. In eYRC 2016 **3,620 Students in 905 Teams** participated in the competition which was spread across 7 themes

- Secured **first place among 167 teams** that participated in “Launch a Module” theme
- Designed and built the robotic arms; programmed the Firebird-V robot using C (ATmega 2560)

Constant Current Load

Dial in any current and the circuit will adjust itself to draw that much current from the supply regardless of the supply voltage. This can be used to test the ratings and specification of power sources

- This device uses a MOSFET and an op-amp to create a variable resistance load which will maintain a set current flowing through it
- The current, voltages, power dissipated are displayed on an onboard LCD using an ATmega microcontroller
- I conceptualized the device, designed the PCB and had it professionally manufactured
- This gave me an end to end experience of creating a complete and meaningful circuit on a PCB

DIY Time-lapse Dolly in the Raspberry Pi Contest 2016: 1st Prize

Instructables is a website specializing in user-created do-it-yourself projects

- Designed a setup for adding motion to a time-lapse photo sequence
- Conceptualized, built and wrote the Instructable for building the Time Lapse Dolly
- **First prize** (Top 4 prizes) out of 198 entries from around the world
- The Instructable can be viewed at www.instructables.com/id/DIY-Time-Lapse-Dolly-1/

3D Indoor mapping using ROS

We wanted to learn the ROS (Robot Operating System) framework. We were able to wirelessly create a 3D map of an environment using a Microsoft Kinect and a Raspberry Pi

Innovatron: 3rd Prize May 2018

- Inter College Mini Project competition organized by Electronics Department, SPIT
- Conceptualized, designed and developed a Room Occupancy system
- Implemented this project in Fractal Analytics

Troubleshooting Competition: 1st Prize 2017; 2nd Prize 2016

- This is an annual competition held by the Electronics Department, SPIT
- The task was to debug and rectify faults in simulation and hardware circuits

Technical Skills

- Embedded C programming (ATmega μ Cs, esp-8266, Arduino)
- CAD (Fusion 360) and 3D Printing
- Complete PCB designing, fabrication and assembly (μ C boards, constant current load)
- Game development in Unity and scripting in C#
- Basic image processing using OpenCV and Python
- Basic knowledge about Robot Operating System (ROS)

Co-curricular activities

- Conducted a departmental circuit troubleshooting competition for 75 students
- Designed and manufactured a custom PCB for conducting a 2-day hands-on workshop on "Introduction to PCB designing, Soldering, Embedded System board design and Embedded C programming"
- Conducted a 2-day hands-on workshop on "Introduction to Microcontrollers, Sensors and Embedded C programming using Arduino"
- SP-Open Mini 2015 (speed-cubing competition) – in charge of volunteer training

Other Interests

- Certified PADI Advanced Open Water SCUBA diver
- Sailing and Wind Surfing
- Photography
- Rubik's cube enthusiast