Chirag Shah

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Profile

Currently working in the R&D department at Sagar Defense Engineering. I have been a member of the core team which developed "**SkyDock**" – India's first Drone in a Box solution.

I have done internships at ideaForge, IIT Bombay and Fractal. I have also conducted 3 workshops related to embedded development during my B.E.

I am a water sports enthusiast having self-learnt windsurfing and am a PADI advanced open water SCUBA diver.

All my work is collated on my website chiragrshah.com

Education

2015 – 2019	Electronics Engineering Sardar Patel Institute of Technology	8.37 CGPA
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%

Work Experience

Embedded Design Engineer - Sagar Defense Engineering (May/2019 – Present)

I have been a core team member in the R&D Electronics department at SDE and have worked extensively on the entire SkyDock product life cycle.

SkyDock is an environmentally protected launching and charging station which keeps the UAV in ready to fly condition 24/7 and launches the UAV at the push of a button, and thereafter aids in precision landing after completing its mission. After landing it automatically starts charging the UAV and its then ready for its next mission. SkyDock is aimed at automating the complete process of flying a UAV and minimizing the response time. Patent pending titled "Method and System to ascertain the location of Drone Box for landing and charging".

My responsibilities include:

- Conceptualizing the initial prototype, designing, and building the hardware for all the electrical and electronic components of SkyDock and its embedded code.
- Designed switching DC-DC converter, li-ion battery management system, electrical panel, and other electronic circuits for SkyDock.
- End-to-end production of the PCB's, BOM generation, vendor negotiations/management for procurement for the production of SkyDock.
- Set up the SMT assembly process – configuring the pick and place machine, hand assembly, solder paste handling and printing, reflow, cleaning, inspection, and testing.

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 UAV segment in India

- Created the CAD model on Fusion 360, fabricated the parts (3D printing/CNC) and assembled the prototype.
- Designed and built the electronics setup to drive the mechanical assembly and wrote its embedded code.

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 advised by Dr Kavi Arya, IIT Bombay under the eYantra Summer Internship 2017 program

- 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)

Understood the implementation of a system in real life across 9 meeting rooms running 24x7 v/s building a prototype

- Devices were designed to consume a low standby current (88 uA) 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)

Developed an augmented reality application in Unity using C# 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 charts

Learnt to translate a business need, get it to life 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 - BE final year project

Worked with Drishti Works; a robotics startup based in Mumbai

- Built a tethered multirotor with an AUW (All Up Weight) of 10 kgs
- Performed a successful 70 min flight
- Developed a 140V to 32V@20A step-down convertor for increasing the altitude capability of the multirotor

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

- Team 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

Used to test the ratings and specification of power sources. Dial in any current and the circuit will adjust the load to draw that current from the supply regardless of the supply voltage

- Used a MOSFET and an op-amp to create a variable load
- The current, voltages and power dissipated are displayed on a LCD using an ATmega microcontroller
- Conceptualized the prototype, designed the PCB and got it manufactured from China

This gave me an experience of developing a complete end to end system

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 and built a setup for adding motion to a time-lapse photo sequence,
- Documented all the steps for building the time-lapse dolly on Instructables
- First prize (Top 4 prizes) out of 198 international entries

3D Indoor Mapping using ROS

Learnt the ROS (Robot Operating System) framework. Wirelessly created 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

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

- Annual electronic circuit debugging competition held by the Electronics Department, SPIT

Technical Skills

- Embedded C programming
- CAD (Fusion 360), CNC milling and 3D Printing
- Embedded system design (PCB designing, fabrication and assembly)
- BOM generation and procurement
- Basic knowledge about OpenCV, Python, Robot Operating System (ROS)

Co-curricular activities

- Conducted an electronics troubleshooting competition for 75 students
- Conducted 2-day hands-on workshops on
    - Introduction to PCB designing, Soldering, Embedded System design and Embedded C programming
    - Introduction to Microcontrollers, Sensors and Embedded C programming using Arduino
    - Adding WiFi to your projects using ESP8266 and MQTT
- 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