Chirag Shah

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Profile

I am a core member of the Research and Development team at Jupiter Electric Mobility (JEM). Prior to JEM, I worked at Log9 materials in the Aluminum Fuel Cell (AFC) and Battery Management System (BMS) teams.

At Sagar Defense Engineering, I was a part of the core R&D team which developed "SkyDock" – India's first Drone in a Box solution for which patents are **granted** by multiple countries **(US-11772819-B2).**

I have done internships at ideaForge, IIT Bombay and Fractal.

Kindly visit my website chiragrshah.com where I have collated all my work.

Work Experience

Deputy Engineer - Jupiter Electric Mobility (Oct/24 – Present)

Log9 Materials was acquired by Jupiter Mobility in October 2024, following which I was transferred to Jupiter Electric Mobility (JEM). JEM designs and manufactures commercial 4W EVs, battery packs for railway applications and Battery energy storage system (BESS).

My key roles and responsibilities are:

- Developed hardware/software prototypes for a load measurement system for cargo vehicles, and performed the PCB design review
- Researching Energy Management Systems (EMS) & topologies for BESS to support build v/s buy decisions
- Assisting in technically reviewing tenders for multiple BESS RFP's
- Researched and analyzed BESS topologies to guide optimal system design for different use cases and tender specifications
- Led integration, testing and commissioning a 20kWh BESS system for Indian Railways
- Managing the technical specifications for a 720kWh BESS project.
- Collaborating with vendors (BMS, EMS, PCS, switchgear) and leading upcoming BESS integration/testing

Associate Electronics Engineer - Log9 Materials (Aug/22 – Oct/24)

Log9 was a nanotechnology company pioneering advancements in li-ion chemistry and battery pack manufacturing. I was a core R&D team member in the **Aluminum Fuel Cell (AFC)** and **Battery Management System (BMS)** team.

BMS team: Firmware Development (Jan/24-Oct/24)
Due to the downsizing of teams at Log9, I took over Firmware development for BMS implementation for 2 OEMs

- Firmware development for new features
- Integration and testing the BMS and battery pack for two 3W-OEMs
- Troubleshooting, bug resolution and testing
- Thermal management system prototype/test jig

AFC team: Electronics System Development (Aug/22 – Dec/23)

- Leading electronics system development with a team of 2-3 team members
- PCB design reviews (fuel cell management system (FMS), power management system (PMS), slave FMS)
- Firmware development on STM32 for the FMS, PMS, slave FMS
- Electronics and power electronics integration and testing
- Filed **six patents** in the areas of fuel-cell management, power management and fuel-cell system design

Embedded Design Engineer - Sagar Defense Engineering (May/19 – Jul/22) – Pune

SkyDock: Electronics and System Development (May/19 – Jun/21)
SkyDock is a launching and charging station which keeps the UAV in ready-to-fly condition 24/7. After landing it automatically starts charging the UAV. Our work was **granted a patent** by US, Denmark, European Patent Office, Australia and Finland (US-11772819-B2)

My responsibilities as a core R&D team member included

- Conceptualized the prototype, designed, and built hardware for all electrical and electronic systems
- Developed, tested and deployed the embedded firmware for BMS, charging pad and SkyDock controller

- Designed the complete PCB set (switching DC-DC converter, battery management system, charging management system etc)
- End-to-end assembly of the PCBs, BOM generation, vendor negotiations for procurement
- Lead a team of 3-4 people to produce SkyDock

Other Projects: Assembly & PCB Design

- Set up the SMT assembly process – pick and place machine programming, solder paste handling and printing, reflow profiling, cleaning and inspection
- Assembled PCBs for UAV subsystems such as flight controllers, power distribution, gimbal control etc
- Designed and assembled various PCBs for power conversion, communication interfaces, and control modules

Internships – (2015 – 2019)

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

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

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

- Occupancy monitoring system across 9 meeting rooms running 24x7
- Designed to consume a low standby current (88μA) for battery operation. The devices connect to each other via a network of RF trans-receivers. Data was sent to AWS IOT core and then pulled into DynamoDB

e-Yantra IIT Bombay: 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 e-Yantra Summer Internship 2017 program

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

Projects/Achievements

Coursera: Algorithms for Battery Management Systems Specialization: Oct 2020

5-Course Specialization dealing with batteries, battery management systems (BMS) and algorithms for BMS

Constant Current Load PCB: 2018

A microcontroller-based load which draws a programmable constant value of current to test power sources. This gave me an end-to-end system development experience

e-Yantra Robotics Competition IIT Bombay 2016: 1st Place (Out of 167 teams)

Designed and built the robotic arms; programmed the Firebird-V robot in embedded-C (ATmega-2560)

Technical Skills

- Embedded systems design & development
- Prototype to minimum viable product
- Schematic design and circuit design
- PCB and flex PCB designing and assembly
- Embedded-C programming (AVR, STM32)
- Peripherals such as SD Card, RTC, Displays
- Communication protocols: CAN, UART, SPI, USB
- Switching and linear power supply design
- BOM generation and procurement
- Analog & digital circuit design (ADC, Op-amps, MOSFETs)
- Lab equipment (Oscilloscopes, Electronic Loads, DMMs)
- Electrical systems development and troubleshooting
- CAD (Fusion 360) and 3D printing

Education

2015 – 2019	Electronics Engineering - Sardar Patel Institute of Technology	8.37 CGPA
2013 / 2015	SSC / HSC	87.5% / 82.31%

Co-curricular activities

- Conducted electronics troubleshooting competition for 75 students
- Conducted multiple hands-on workshops on PCB design, microcontrollers and embedded-C programming

Other Interests

- Certified PADI advanced open water scuba diver
- Sailing and windsurfing