DHAIVAT JOSHI

| Embedded Software Engineer | PCB Designer

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Leipziger Chaussee 14A, Magdeburg, Deutschland

SKILLS

Software

KiCad 7 (EDA), Altium Designer, Proteus, EasyEDA, Microsoft Visual Studio, MS Office Suite, Arduino IDE, STM32Cube IDE, MPLAB X IDE, Jenkins, Github, GIT, WinCvs, Phabricator, Doxygen

Programming Language

C, C++, Embedded C, FreeRTOS, ROS, Python, PHP, HTML, MQTT

Microcontroller Board

STM32, ESP8266ex, ESP32, PIC18, ATtiny85, Arduino UNO/ Mega, Raspberry pi 3 model B

Communication Protocols

IOT, MQTT, SPI, I2C, UART, ESPNOW, MODBUS, CANBUS

Floor Skills

Rapid Prototyping, Micro Soldering, PCB Fabrication, Circuit Debugging

EDUCATION

Master's degree in Electrical Engineering and Information Technology

Otto-von-Guericke University Magdeburg

10/2023 - Present Magdeburg, Germany

- Field of Focus: Electrical, Embedded System, Control System, Power Electronics

B.Tech in Electronics and Communication

CHARUSAT University

06/2017 - 05/2021 Anand, India

- Field of Focus: Embedded System, Basics of Electronics and Power Electronics

LANGUAGES

German	Intermediate	●●○○○
English	Proficient	●●●●○
Hindi	Native	●●●●●

ABOUT ME

Aspiring electrical engineer with a passion for innovation and technology. Currently pursuing a Master's degree in Electrical Engineering and Information Technology at Otto-von-Guericke University Magdeburg, Germany. Eager to explore the intersections of hardware and software, with a strong foundation in both fields. Committed to academic excellence and excited to contribute to the ever-evolving world of technology. Seeking opportunities to learn, collaborate, and make a meaningful impact in the field.

EXPERIENCE

InSignEx — 06/2021 - 10/2023

Embedded Software Developer — Anand, India

- Over 2.4 years as an Embedded Software Developer at InSignEx, specializing in embedded systems and IoT integration, with expertise in protocols like SPI, I2C, UART, MODBUS, ESPNOW, and MQTT.
- Developed and optimized firmware for microcontrollers (PIC18, ESP8266EX, AVR Atmega328p) and the Gh5001 Green House Monitoring System app, using MQTT, Thingspeak, and Firebase for data-driven applications.
- Designed and optimized schematics and PCB layouts in KiCad, enhancing circuitry and power management for Hydroponic System and Wireless Sensor Node projects.
- Completed six hardware projects, created three custom Android apps with Kodular, and developed three C libraries to enhanced system functionality and versatility.
- Skilled in C, C++, and Python, with strong experience in RTOS development, microcontroller programming, and project data management using Visual Studio, Arduino IDE, and Excel with Python.

InSignEx — 01/2021 - 05/2021

Project Internship — Anand, India

- Developed an IoT Voice-activated scrolling display using Node MCU (ESP8266) and P10 LED matrix panels, allowing wireless control via an Android app
- Designed schematic and PCB layouts using KiCad and fabricated the PCB using the Ferric Chloride etching process for efficient prototyping
- Utilized MQTT protocol for global connectivity, enabling remote updates and live control of the display over the internet from any location
- Developed a customized Android app in Kodular for seamless voice-command functionality, supporting dynamic content updates on the LED display with high visibility and user flexibility

EXTRACURRICULAR ACTIVITIES

Electrical Team Lead — 02/2019 - 03/2021

Ojaswat Motorsport - University's Formula Student Team — Anand, India

- Led an electrical Team, converting a racing bike circuit to suit a Formula student car application
- Designed and developed the entire electronic circuit system for a Formula Student Car
- Designed and developed the complete electronic circuit system for a Formula student car, enhancing performance and safety features
- Built and integrated an Arduino-based RPM meter, gear indicator, electronic steering wheel with pneumatic shifting, GPS data logger, and Brake System Plausibility Device (BSPD) to ensure vehicle safety and operational reliability.

Gujarat Industrial Hackathon (GIH) — 01/2019 - 05/2019

Smart Helmet Module — Gujarat, India

- Developed an automatic accident detection module mounted on a helmet, incorporating essential safety features for real-time emergency response
- Designed schematic and PCB layouts in EasyEDA, fabricating two prototype versions for thorough testing and refinement of the system
- Integrated key components, including an Atmega328p for processing, MPU6050 for angle and impact detection, and HC05 Bluetooth module for communication, along with a mobile app that alerts predefined emergency contacts with live location and victim details

CERTIFICATION

Goethe-Institut
German A1 Language Certificate

AutoLexi
EV Mathematical Modeling on Sci-Lab

SAE INDIA
Electric Two Wheeler Design, India

PROJECTS

Hydroponic System - InSignEx

- Designed a fully automated hydroponic system with remote control via ESP8266, managing pH and humidity sensors, pumps, and feeders with a 12V DC supply; developed schematics and PCB layout using KiCad
- Integrated an I2C RTC with backup battery for precise relay timing, enabling automated Schedule and Repeat modes to streamline operations
- Created an Android app for seamless system configuration over MQTT using JSON data, supported by RTOS-based software for efficient control and real-time monitoring

Electronic steering wheel with pneumatic shifting system - OJASWAT MOTORSPORT

- Designed and developed a steering wheel for a Formula Student car to control essential car systems
- Integrated electronics for gear shifting, radiator fan control, and sensor data display, all managed by dedicated microcontrollers
- Components used include multiple microcontrollers for task-specific processing and CAN BUS protocol for efficient inter-controller communication
- Displays real-time sensor data on the steering wheel, including engine temperature, RPM, speed, and gear position
- Enhanced driver experience by providing real-time performance data, enabling informed decisions during races

GPS Data Logger - OJASWAT MOTORSPORT

- Developed a GPS Data Logger using Arduino Uno and u-blox NEO-6M GPS to capture location and time data every five seconds, storing it on a micro-SD card in a comma-separated file format with stable power from a linear voltage regulator
- Achieved accurate recording of location and time data across various locations, with the system capable of logging up to 1,000 data points before requiring a reset
- Processed logged data with GPS Visualizer to generate .kml files for visualizing journeys on Google Earth; designed for a Formula student car to record track data and conduct performance testing in kilometers

Brake System Plausibility Device (BSPD) - OJASWAT MOTORSPORT

- Designed a Brake System Plausibility Device (BSPD) for a Formula Student car, ensuring safe operation in compliance with Formula Bharat safety regulations
- Developed a non-programmable circuit that integrates with the shutdown circuit to prevent simultaneous braking and acceleration, enhancing vehicle safety
- Utilized components such as the LM393 comparator and an AND gate to monitor brake pressure and throttle position using analog sensors for effective fault detection
- Implemented functionality that interrupts the shutdown circuit when brake pressure exceeds 30 bar or throttle position exceeds 25%, preventing unintended vehicle movement and ensuring reliable brake operation

IOT SpyBot using Raspberry Pi - B.Tech Project

- Designed an IoT SpyBot using a Raspberry Pi to be remotely controlled via a mobile app, transmitting live video, temperature, pressure, and movement data
- Equipped with a mini USB camera and LEDs for video capture and illumination, enabling operation in low-light conditions
- Integrated 5 sensors for environmental detection: Rain sensor, BMP pressure sensor, Humidity sensor, LDR (light intensity), and Ultrasonic sensor for object detection and distance
- Powered by a 12V battery and uses 4 DC motors driven by two L298N motor drivers for mobility
- Data storage on Google Firebase provides real-time sensor tracking, with live video available locally and remote robot control accessible globally

USBASP AVR Programmer - B.Tech Project

- Developed USBasp, an in-circuit programmer for Atmel AVR controllers, utilizing an ATMega88 or ATMega8 microcontroller along with essential passive components
- Implemented In-System Programming (ISP) for direct on-board programming of AVR microcontrollers in-circuit, enhancing programming efficiency
- Commonly paired with Arduino boards, providing an affordable and straightforward solution for AVR ISP programming