Abdul Haseeb

Embedded Software Developer

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Profile

Embedded Software Developer experienced in firmware design, Python tooling, and secure communication protocols, with proven contributions at NXP Semiconductors and Vilisto GmbH. Skilled in C/C++, Python, microcontrollers, hardware integration, and applied research.

Work Experience

11/2024 – To-date
Hamburg, Germany

Quality Engineer-Electrical (Full-Time), *Vilisto GmbH*

- Serve as the primary liaison between producers, suppliers, and the internal development team to drive improvements in thermostat quality.
- Ensure production quality and streamline the repair process using Microsoft Power Apps, Office and other automation tools to pin-point issues efficiently.
- Enhance and maintain the Python-based test tool and its associated PCB, enabling effective testing and diagnostics during thermostat repair.

11/2024 – 12/2024

Python Software Developer (Working Student), *NXP Semiconductors*

- Maintained and updated features like SBOM reports generation of the native Python API based upon the Blackduck SCA tool used at NXP.
- Automated the testing of the features I added to the Python API of Black duck using unittest python.

12/2023 – 08/2024

Master Thesis Student, *NXP Semiconductors*

- A Formal Verification Approach to Global Platform's T=1' Specification for I2C in Secure Elements

02/2023 – 12/2023

Embedded Software Engineer (Working Student), *NXP Semiconductors*

- Optimized and analyzed state machine performance in middleware for Secure Elements hypervisor communication.
- Supported developers with sample setups and dev boards, including early FPGA designs.

07/2021 – 02/2023

Embedded Software Engineer (Working Student), *Vilisto GmbH*

- Designed/debugged firmware and build/flash tools for thermostats, including test tools setup for sensors and actuators used in the thermostats.
- Conducted R&D on new/alternative components and developed drivers for sensors and actuators.

Education

02/2020 – 07/2025
Hamburg, Germany

MSc. Information and Communication Systems (Secure and Dependable IT Systems
Technical University Hamburg (TUHH)

- **Master Thesis:** A Formal Verification Approach to Global Platform's T=1' Specification for I2C in Secure Elements
- **Project Arbeit:** Steps towards ML-based Toolchain for Intrusion Detection Systems in CAN Networks

02/2020 – 07/2025
Karachi, Pakistan

Bachelors Electronic Engineering
NED University of Engineering and Technology(NEDUET)

- **Bachelor Thesis**: Smart Cane for Visually Impaired

Projects

12/2024 – To-date
Hamburg, Germany

AgriOT – Smart Agriculture Monitoring & Control System

Side Project
https://abdul2k10023.github.io/htmRusher/projects/agri.html

- Developed an IoT-based agriculture solution using ESP32, RS-485 soil sensors, and automated irrigation with MQTT backend and OTA updates.
- Designed custom PCB with low-power HW for reliable field deployment.
- Built Grafana dashboards for real-time soil, climate, and water usage, currently working on ML-based plant nutrient monitoring using Raspberry Pi and camera modules.

10/2024 – To-date
Hamburg, Germany

ESP32-Powered Drone with Scratch Integration

Side Project

- Designed a custom ESP32-based drone with MPU6050 gyroscope, optical flow sensor, and LiDAR stabilization module.
- Implemented firmware supporting motion commander commands via Bitcraze cflib library over UDP, and built the Python API layer enabling Scratch integration.

02/2024 –08/2024
Hamburg, Germany

Master's Thesis – Formal Verification of I^2C T=1' Protocol from GP

NXP Semiconductors - TUHH

- Modeled the **GlobalPlatform T=1' I^2C protocol for Secure Elements** and applied formal methods (MBT, MBMT) to improve compliance testing reliability.
- Utilized **NuXMV/NuSMV model checkers** with temporal logic to evaluate specification correctness, addressing challenges like **state explosion** and property quality.
- Enhanced compliance verification by **deriving comprehensive test cases** and benchmarking against GlobalPlatform's existing test bench at NXP, improving interoperability.

Language Skills

- English Fluent (IELTS 7.0)
- German (B1)
- Urdu (Native)

Technical Skills

Languages	Hardware	Protocols	Tools	Modelling
Python	ESP32	MQTT	Git	UML based modelling
C/C++	STM32	I^2C	Docker	Enterprise Architect
Bash Scripting	Raspberry Pi	SPI	Grafana	Formal Verification
FreeRTOS	ARM Cortex M0	UART	Linux	LTL, CTL
		CAN	PostgreSQL	Model Checkers
		LoRAWAN		NuSMV/NuXMV
		RS-485		