Muhammad Manzar Hussain

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EXECUTIVE SUMMARY

Experienced Engineer specializing in R&D, testing, and performance evaluation for wireless technologies. Expert in signal processing and wireless coexistence standards, optimizing system performance and reliability. Proven innovator and problem solver in collaborative environments.

PROFESSIONAL EXPERIENCE

- **perisens GmbH**   Feldkirchen, Germany
  Project Development Engineer   *April 2020 - Present*

  - Expertise in 802.11a/b/g/n/ac/ax/be, Bluetooth/BLE, and UWB technologies.
  - Developed methods for monitoring breathing estimation inside vehicles using wireless channel data from Wi-Fi and UWB signals.
  - Measured and analyzed Bluetooth signal strength, transmit power, and range; evaluated the advertising and scanning efficiency of a smartphone using a rotary platform for 360-degree analysis.
  - Performed comprehensive field and laboratory measurements, including evaluations of connection stability, reconnection performance, Tx Power, RSSI, throughput, data rates, latency, packet loss rates, and coverage area.
  - Assessed Wi-Fi features such as OFDMA, beamforming, EVM, MCS, antenna gain, SISO/MIMO performance, and frame aggregation efficiency.
  - Identified interference sources and coexistence impacts, tested roaming performance, transition times, and examined Wi-Fi security protocols.
  - Developed performance evaluation tools, managed test beds, automated test setups to streamline testing processes, and utilized RF test equipment effectively.
  - Conducted research on emerging wireless technologies, producing detailed measurement reports, presentations, and user guides.

CORE COMPETENCIES

- **Coding**: MATLAB, Python, Linux Bash, Windows Batch & PowerShell, C, C++

- **Communication and Testing Tools**: SSH, PuTTY, ADB, Win-SCP, TCP/IP, UDP IPERF, Ping, Wireshark, Ellisys Bluetooth Explorer & Analyzer, Wi-Fi Sniffer

- **RF Measurement Equipment**: Spectrum Analyzer, Signal Generator, Network Analyzer, Channel Emulator, USRP, UHD, GNURADIO

- **Automotive Telematics**: ET-Framework & TUT, NTG6, NTG7, Gen20x.i2, Gen20x.i3

- **Operating Systems**: Android Automotive, QNX, RichOS, Linux, Windows

- **Embedded**: NRF52 DK (BLE), UWB DWM1000/3000, Raspberry Pi, Arduino, ESP32

- **Collaboration and Version Control:** Git/GitLab, Confluence

- **Technical Documentation and Design**: LaTeX, Eagle PCB Design

Educational Background

- **Hochschule Bremen** — Bremen, Germany
  MSc. in Electronics Engineering — *March 2018 - March 2020*
  - **Dissertation**: "In-Vehicle Human Presence Detection and Breathing Rate Estimation using IEEE 802.11n Channel State Information".
  - **Grade**: 1.6 (German Grading Scale)

- **Sukkur IBA University** — Sukkur, Pakistan
  BE in Electrical (Telecommunication) Engineering — *August 2011 - November 2015*
  - **Thesis**: "Interference Alignment in Two-tier Heterogeneous Cellular Network".
  - **Grade**: 2.3 (German Grading Scale)

Publications and Patents

- **Patent, 2022**: "Vehicle having a presence detection system and warning method alerting to a living being having been forgotten in a vehicle"

- **Conference, 2020**: "In-Vehicle Breathing Rate Monitoring Based on WiFi Signals"

- **Matlab Expo, 2019**: "Analysis of Multi-Path Channels Using the WLAN Packet Preamble"

- **Conference, 2018**: "Stochastic geometry based interference alignment in two-tier heterogenous cellular networks"

Recent Educational Pursuits

- **Career Track "Machine Learning Engineer" from DataCamp**:

MLOps Concepts	Introduction to MLflow
End-to-End Machine Learning	Fully Automated MLOps
Developing Machine Learning Models for Production	Predicting Temperature in London (project)
Introduction Shell	ETL and ELT in Python
Predictive Modeling for Agriculture (project)	Monitoring Machine Learning Concepts
MLOps Deployment and Life Cycling	Monitoring Machine Learning in Python
Introduction to Docker	CI/CD for Machine Learning

- **Individual Courses**:

Introduction to Deep Learning in Python	Programming For Beginners - Master the C Language
Advanced Deep Learning with Keras	Advanced C Programming Course (In Progress)
Image Modeling with Keras	

Linguistic Proficiency

- **English**: Professional proficiency

- **German**: Intermediate (B1)

- **Sindhi and Urdu**: Native proficiency