Ratan Lal Bunkar

Taoyuan City, Taiwan, +886-0975010438
ratanbunkar2@gmail.com, LinkedIn

Professional Summary

Results-driven Systems Integration and Test Automation Engineer with hands-on experience in smart IoT and embedded electromechanical medical devices. Skilled in Python-based automation, smart test solution development, and ATE implementation for Smart IoT systems. Proven track record in NPD/NPI support, regulatory compliance (ISO 13485, ISO 14971, ISO 9001), and cross-functional collaboration. Adept at translating user needs into system requirements, conducting DFMEA, executing the full verification and validation (V&V) cycle, and performing test equipment validations. Passionate about building scalable, cost-effective new medical devices, test solutions, and advancing innovation in regulated environments.

Work Experience

System Integration and Test Solutions Engineer

SHL Medical, Taoyuan, Taiwan | May 2023 – Present

- Engineered custom test jigs and ATE fixtures to validate critical performance parameters of autoinjectors, such as plunger force at variable speeds, dose accuracy, injection timing, and retraction/hold time, ensuring compliance with system specifications and ISO 11608 requirements; addressed scenarios including motor stall detection
- Proposed and prototyped an AI-driven stall detection algorithm using moving average filtering for early diagnostics of motor failure, demonstrating initiative in predictive validation strategies.
- Designed and Developed Python-based automated test systems with ATE-style logic integrating BLE, UART, and sensors to validate connected medical devices, reducing manual effort, boosting throughput, and supporting ISO 13485/14971 compliant documentation including EURS, SDS, TMV, and IQ/OQ/PQ.
- Collaborated across hardware, firmware, quality, and manufacturing teams to perform DFMEA and support DFM/DFA reviews, enabling robust design transfer from development to production.
- Designed and delivered cCap Module – a BLE-based wireless broadcasting device for the Molly Soul autoinjector platform used in clinical trials. It detects cap removal and transmits event timestamps, device ID, and configurable metadata to compatible Bluetooth receivers, supporting clinical injection decision-making.
- Designed and delivered SmartHub a wireless autoinjector data collector with BLE-to-cloud sync. Enabled real-time data capture and remote monitoring to support patient adherence and device tracking.

Research Assistant

Systems and Control Lab, Taipei, Taiwan | Feb 2021 – Jan 2023

- implemented machine learning and signal processing techniques for audio noise reduction and voice separation, including Non-Negative Matrix Factorization (NMF), Robust PCA (RPCA), and REPet.
- Awarded the SVS Research Grant and the Taipei Tech International Student Scholarship in recognition of research impact and academic performance.

Control Systems Engineering Intern

DCM Engineering, Punjab, India | Mar 2019 – Aug 2019

- Gained hands-on experience with Siemens PLC programming using Ladder Logic in Simatic Step 7 and HMI dashboard setup for real-time monitoring and fault visualization. Supported commissioning of industrial automation systems, including wiring, signal mapping, and control documentation.

Education

M.S. in Electrical Engineering

National Taipei University of Technology, Taiwan
Feb 2021 – Jan 2023

B.S. in Electrical Engineering

Indian Institute of Technology (IIT) Ropar, India
Aug 2016 – Aug 2020

Skills

Systems Engineering: Requirements engineering, system lifecycle development, stakeholder collaboration, system architecture design, design transfer, DFMEA (Design Failure Mode and Effects Analysis), verification and validation
Regulatory Compliance & Standards: ISO 13485, ISO 14971, ISO 9001, IEC 60601, ISO/IEC/IEEE 15288, ISO/IEC 62304
Modeling & System Design Tools: SysML, UML, Enterprise Architect, CATIA Magic/Cameo Systems Modeler
Test Automation & Validation: Skilled in ATE development, Python-based test scripting, experienced in writing test plans and protocols, executing Test Method Development and Test Method Validation
Embedded Communication Interfaces: Skilled in BLE, UART, RS-232/RS-485 serial communication, with protocol analysis using pyserial, bleak, pyshark, and Wireshark for debugging and test automation.
Machine Learning, Data Analysis & Visualization: Utilization of pandas, numpy, matplotlib, scikit-learn, and Pytorch for analyzing test results, visualizing data, and building predictive models to inform decision-making processes.

Additional Information

Languages: English (Full Professional), Hindi (Native), Mandarin (Basic), Open to relocation across Taiwan and internationally.