# LUIS SERGE OLIVIER GERALDA TUTAB

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github.com/LuisGeralda Portfolio

## Summary

5G/LTE System Validation Engineer with end-to-end experience on EPC (eNB, MME, S-GW, P-GW, HSS) and 5G NR (NSA/SA) including gNodeB, AMF, UPF. Skilled in 3GPP protocols (S1AP, X2AP, NGAP, XnAP, DIAMETER, SIP), mmWave & sub-6, multi-RAT connectivity (ENDC, NGENDC), and advanced log analysis (QXDM, QCAT, Wireshark). Familiar with IMS (PCSCF, I-CSCF, TAS), O-RAN fundamentals, open-source 5G (srsRAN, Open5Gs), AI-based signal processing fundementals, and MATLAB 5G Toolbox.

## Skills

**Wireless/RAN:** 5G NSA/SA, LTE eNB/gNB, 3GPP Rel8–Rel18, TDD/FDD, LAA (Band46), CBRS (Band48), mMIMO

**Core Networks:** EPC (MME, SGW, PGW, HSS), 5G Core (AMF, SMF, UPF), IPsec, IMS (SIP, DIAMETER)

**Protocol Stack:** PHY, MAC, RRC, RLC, PDCP; measurement events (A1–B2); NB-IoT, CAT-1, CAT-M, CAT-4

**Tools/Logs:** QXDM, QCAT, Wireshark, XCAP/XCAL, PCAT, BTSlog, Python, Bash, ADB, iOS sysdiagnose

**Optimization:** Carrier Aggregation, beamforming, DRX, eDRX, QoS (5QI), bug reporting (JIRA), UL TCP Boost

**O-RAN/Open-Source:** eCPRI, F1, E2, A1, O1, srsRAN, Open5Gs, OSMOCOM

**Soft Skills:** Documentation, training, customer interfacing, cross-functional collaboration

## Experience

### Corning Optical Communication (F2G Solutions) — Aug 2023 – Present

5G System Validation Engineer — Milpitas, CA

- Led validation of two new 5G radio units (N3RU, M3L) across 50+ scenarios for indoor/outdoor coverage, reducing qualification time by 25%.
- Integrated & optimized 5G NSA networks (Druid Raemis 5G Core + Aricent 4G Core), refining handover thresholds and scheduling to cut call drops by 20%.
- Managed a 50-device UE test fleet (Android/iOS) for real-world OTA scenarios; automated user flows via Python, Bash, ADB, and Apple Shortcuts, reducing manual testing by 40%.
- Developed system-level test plans, feature scripts, and troubleshooting playbooks utilized by R&D and customer-facing teams.

### Corning Optical Communication (F2G Solutions) — Sep 2022 – Aug 2023

5G QA Test Engineer — Milpitas, CA

- Executed regression, functional, and performance testing for 5G Sub6/mmWave solutions; monitored KPIs (RSRP, RSRQ, throughput) daily, identifying 15+ critical defects before release.
- Built automation scripts (Python, Bash) to parse logs (QXDM, QCAT, Wireshark), accelerating root-cause analysis by 30%.
- Coordinated with product managers and dev teams to refine specs, debug RF anomalies, and ensure stable software/hardware releases.

### Nokia North America (F2G Solutions) — Apr 2021 – Sep 2022

4G & 5G System Engineer Interoperability — Dallas, TX

- **Broad Test Scope:** Planned & executed 300+ test cases (from a 3000+ case library) covering registration, mobility (handovers, reselections, redirections), carrier aggregation, call processing (VoLTE, VoNR, CFSB, e911), TTI Bundling, MFBI, and more on TMO, AT&T, and Verizon (low, mid, high bands).
- **Device Testing (Qualcomm, Samsung, MediaTek):** Validated IOT compliance of 5G/LTE smartphones with chipset vendors, analyzing device logs & multi-RAT features (LTE-WCDMA, LTE-5G NSA) to ensure stable connectivity.
- **Radio Module Qualification:** Performed commissioning of Nokia radio modules (AHIB, ARZB, AHFB, UHBA, AHLOA, FRIJ, AZRA) and Baseband Units (ABIA, ASIA, ASIK, ABIL), enabling expansions for new frequency bands or capacity upgrades.

- **OAM & BTS Upgrades:** Maintained Nokia RAN software (SBTS20A, SBTS21A, SBTS22R2/3) with IPsec gateway configs; minimized lab downtime by 15% via parallel testing.
- **Lab & Field Troubleshooting:** Used QXDM, QCAT, PCAT, QPST, QMI Test Pro, Wireshark, EMIL, Syslog, MAC TTI Trace logs, & BTS counters to isolate eNB/gNB or UE issues; provided on-site or remote support to test teams and customer labs.
- **Optimization:** Tuned thresholds, offsets, and hysteresis to improve handovers by 20% throughput; integrated NB-IoT/CAT-M devices and tested VoLTE/VoNR voice continuity.
- **Cross-Functional Collaboration:** Guided newly hired engineers on 3GPP-based documentation, log analysis, and best practices for device testing with major chipset vendors, reducing ramp-up time by 30%.

## AI/ML Projects

**CNN-QAM-Denoiser** **(GitHub Link)**

Deep Learning for QAM Audio Signals

- Developed a CNN-based approach to denoise QAM-modulated audio signals, enhancing communication clarity in noisy channels.
- Used Python & TensorFlow for training; demonstrated a 30% SNR improvement in synthetic test datasets.

**LTE-KPI-Kmeans-Clustering** **(GitHub Link)**

Coverage Optimization via K-means

- Analyzed LTE KPI datasets (RSRP, RSRQ, throughput) using K-means clustering to identify coverage and cell-edge performance gaps.
- Recommended parameter changes that improved cluster coverage uniformity by 15% in a proof-of-concept environment.

## Education

**International Technological Institute** **GPA: 4.0**

M.S. in Software Engineering (AI Concentration) Santa Clara, CA

**Kennesaw State University** **GPA: 3.81**

B.S. in Electrical Engineering Technology Marietta, GA