

MAHMOOD ABUROMOH

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Ottawa, ON, Canada

Permanent resident in Canada

Summary

Senior Optical Validation Engineer with 7.5 years of combined experience in industry and academic research, specializing in high-speed optical communication systems (1.6 Tbits/s). As a validation engineer at Nokia, I supported validation efforts for multiple NPI products, supporting over 25 automated test cases across four platforms using VB.NET, Python, SQL, and JMP. I work closely with cross-functional teams to troubleshoot complex system behaviors and drive root cause analysis. During my PhD, I collaborated with Fujitsu to study the impact of high-speed digital converters (up to 128 Gbps) on pluggable optics like CFP2 and QSFP-DD. I designed and simulated DSP architectures, introduced advanced methods for signal recovery, and developed machine learning and Viterbi-based algorithms to optimize performance in low-power, high-speed data center applications. I also contributed to lab characterization and validation planning for converter technologies. My technical expertise spans optical instrumentation (EDFAs, VOAs, AWGs, spectrum analyzers), DSP algorithm development, and collaborative software engineering using Git and Microsoft Azure. I'm a strong communicator and team player, committed to continuous learning and delivering high-quality, data-driven solutions.

Skills

- **Optical System Integration & Verification:** Hands-on experience with optical engines, lasers, modulators, detectors, and transceivers.
 - **Electrical/Optical Characterization:** Experience analyzing key performance metrics of optical engines and semiconductor devices.
 - **Test Planning & Automation:** Developed and executed detailed optical performance test plans; automated test scripts using Python, MATLAB, and VB.NET.
 - **Lab Equipment Proficiency:** Skilled in setting up complex lab environments using oscilloscopes, spectrum analyzers, network analyzers, BERTs, and AWGs.
 - **Root-Cause Analysis & Debugging:** Conducted root-cause analysis of optical performance issues through lab experimentation and collaboration with design teams.
 - **Data Analysis & Visualization:** Proficient in SQL, JMP, and Azure, applied DOE and Gauge R&R methodologies.
 - **Technical Documentation & Reporting:** Delivered technical reports and presentations to stakeholders across engineering and product teams.
 - **Project Management & Version Control:** Experienced with Jira for task tracking and Git and Microsoft Azure for collaborative coding.
 - **Semiconductor Knowledge:** Understanding of optical transceivers, DSP blocks, and digital communication systems.
 - **Embedded Systems Exposure:** Familiarity with embedded software debugging and microcontroller programming.
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Education

Doctor of Philosophy (PhD) in Coherent Optical Communication Systems	2022
Aston University, Birmingham, UK	
Master's in Science (MSc) in Broadband and Optical Communications	2017
Bangor University, Bangor, UK	
Bachelor in Science (BSc) in Electrical and Telecommunication Engineering	2015
Jordan University of Science & Technology, Irbid, Jordan	

Experience

Senior SW/HW Optical Engineer	<i>Apr 2022 - Present</i>
Nokia Inc., Ottawa, Canada	

- Engineered and executed over 25 cutting-edge software/hardware validation tests for diverse optical communication (photonic) products, utilizing VB.NET, Python, and SQL, alongside advanced optical equipment, enhancing product reliability and performance.
- Designed and maintained automated test scripts for new product introduced to the market to adjust operating conditions and capture measurement data, improving test efficiency by up to 50%.
- Established complex lab setups using high-speed electrical/optical equipment including oscilloscopes, spectrum analyzers, and BERTs.
- Coordinated optical plug introduction activities and led the successful launch of 30+ software releases by leading a cross-functional team of developers and product engineers, enhancing interdepartmental collaboration and alignment with corporate objectives.
- Supported data collection and analysis using data cloud services and data visualization tools such as JMP and Azure, regularly presenting findings to both technical and non-technical audiences, improving decision-making processes.
- Conducted root-cause analysis of optical performance issues, contributing to faster resolution and improved product reliability.

Research Assistant in Optical Communication Systems	<i>Jan 2018 – Apr 2022</i>
Aston University, Birmingham, UK	

- Collaborated with industry sponsors to identify and address research objectives, leading to the development of cutting-edge DSP and machine learning solutions for digital converter impairments communication systems, culminating in four esteemed conference proceedings.
- Engineered MATLAB models for coherent optical transceiver components and DSP blocks, verified through rigorous lab measurements and characterization tools, and enhanced lab automation with Python scripting.
- Demonstrated extensive hands-on experience with spectral/wave analyzers, arbitrary wave generators, and other telecommunications instruments. This practical expertise contributed to work recognized at top-tier conferences, highlighting the practical relevance and high standards of my research in optical communications and demonstrating a deep understanding of communication theory.

MATLAB Instructor	<i>Jan 2019 – Jan 2021</i>
Aston University, Birmingham, UK	

- Delivered engaging MATLAB tutorials to over 60 engineering undergraduate students.
- Developed comprehensive support materials, including detailed guides and problem sets, enhancing the learning experience for participants.
- Facilitated hands-on coding sessions that improved student performance.

Electrical Engineer

Jul 2015 – Jul 2016

Kuwait Portland Cement Company, Kuwait

- Managed and directed over 30 electricians and technicians to ensure optimal performance and safety.
 - Documented all maintenance work and procedures conducted.
 - Maintained and troubleshooted high voltage machines and electrical panels.
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Publications

- Abu-Romoh, M., Sygletos, S., & Forsyia, W. Neural-network-based pre-distortion method to compensate for low resolution DAC nonlinearity.
 - Nguyen, T.T., Abu-Romoh, M., & Ellis, A. Artificial neural network-based compensation for transceiver nonlinearity in probabilistic shaping systems.
 - Abu-Romoh, M., Nguyen, T.T., & Forsyia, W. Numerical study on the combination of probabilistic shaping and digital resolution enhancer for high baud rate optical communications.
 - Abu-Romoh, M., & Forsyia, W. Experimental verification of 64-Gbd/64-QAM interworking of probabilistic shaping with a digital resolution.
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Certifications

- Foundations of Project Management, Coursera/Google
- Machine Learning Specialization, Coursera/Stanford University
- Deep Learning, DeepLearning.AI
- Optical networking, Nokia