

Keynote speech

From QoS to QoE: Rethinking Multimedia Quality in the Era of 5G, AI, and Immersivity

Kamal Lamichhane
Nepal Telecom
Nepal
kamal.lamichhane@ntc.net.np

ABSTRACT

As multimedia services evolve from conventional image/video toward immersive and interactive experiences, the traditional network-centric definition of service quality is becoming increasingly insufficient [1]–[5]. Historical network management frameworks have traditionally relied on objective, network-layer performance indicators such as throughput, latency, jitter, and packet loss. However, these parameters alone cannot adequately explain how users perceive and evaluate the quality of immersive and context-dependent multimedia experiences [2]–[6]. This plenary explores the transition from conventional Quality of Service (QoS) centric network management toward a human-centric Quality of Experience (QoE) paradigm for 5G and beyond [2], [3], [7]. Objective No Reference Quality Metrics (NRQMs), designed based on Artificial intelligence (AI), estimate multimedia quality without requiring a pristine reference and are being increasingly important for estimating perceptual-quality in real-time in 5G and beyond networks [6],[7],[13][15]. The presentation further examines how key 5G and beyond network technologies, including Software-Defined Networking (SDN), Network Functions Virtualization (NFV), Multi-Access Edge Computing (MEC), and Network Slicing can provide the architectural foundation for QoE-aware service delivery. The integration of these capabilities with AI techniques opens the possibility of predictive, autonomous, and closed-loop QoE management [6]–[14]. Finally, the plenary discusses how telecommunication service providers can unlock new business values and modernize their offers by transitioning from Service Level Agreement (SLA) based services to Experience Level Agreement (ELA) based service model [11] [16].

Index Terms— QoS; QoE; 5G Network; AI; Immersivity.

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Speaker's short biography:



Kamal Lamichhane received his B.E. degree in Electronics and Communication Engineering from Pokhara University, Nepal, in 2003, and his M.Sc. degree in Information and Communication Engineering from the Institute of Engineering, Pulchowk Campus, Nepal, in 2010. In 2018, he received one-year research fellowship at Sapienza University of Rome, Italy and accomplished his Ph.D. from Roma Tre University, Rome, Italy, in 2023, with his doctoral research focused on the quality assessment of multimedia content. He has been working at Nepal Telecom for nearly 20 years and currently serves as a Manager. Prior to joining Nepal Telecom, he worked as a full-time faculty member at Pokhara Engineering College and the Western Regional Campus, Pokhara, for more than three years.