

Universal access to education based on Software Defined Radio (SDR): The case of Mali

Souhahébou Coulibaly*, Mamadou BA*, Ibrahima NGOM**, Ahmed Dooguy KORA, Samuel OUYA*

*Laboratory LITA, Higher Polytechnic School, University Cheikh Anta Diop of Dakar, Senegal
souhacoul3@yahoo.fr, mamadou.ba@esp.sn, ibrahima.ngom@esp.sn, ahmed.kora@esmt.sn, samuel.ouya@gmail.com

Abstract—This study presents an innovative solution to improve access to education in Mali using a private 4G/5G mobile network based on software-defined radio (SDR) technology. Faced with the persistent challenges of the Malian education system, including insecurity, recurrent strikes, and lack of infrastructure, our approach integrates cutting-edge technologies to offer a resilient and flexible alternative. The proposed architecture combines 5G Non-Standalone (NSA), SDR, and an IP Multimedia Subsystem (IMS) to create a comprehensive educational ecosystem, including an online learning platform. Our experiments demonstrate the technical feasibility of this solution, with successful 5G connectivity and educational content streaming tests. The results show that this approach can effectively extend network coverage in underserved areas and provide educational services even in challenging conditions. While challenges remain in terms of scalability and security, this research opens new perspectives to reduce the digital divide in education in developing countries facing similar obstacles.

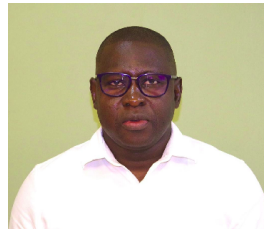
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Souhahébou Coulibaly is a doctoral student at the LITA lab of Cheikh Anta Diop University in Dakar. She holds a master's in physics and electronic systems/telecommunications from UCAD. Her research focuses on IoT, fog computing, intelligent systems, VoLTE, CoAP, MQTT and related areas.



Mamadou BA is a PhD student at the LITA lab of Cheikh Anta Diop University in Dakar, with a master's in physics and electronic/telecommunication systems from UCAD. His research centers on IoT, fog computing, intelligent systems, VoLTE, CoAP, MQTT, and related fields.



Pr I. NGOM is Director of Studies at ISFAD and lectures at ESP-UCAD, Dakar. He serves as a governmental Scientific Advisor and Senior IT Expert, and has been a Certified Trainer in Cisco, Huawei, Microsoft, and VMware technologies since 2006.



Ahmed Dooguy KORA is a doctoral student at LITA, Cheikh Anta Diop University, Dakar, with a Master's in Multimedia Networking from ESMT. His research focuses on IoT, Intelligent Systems, SDN, and IP multimedia subsystems.



Professor Samuel Ouya directs the LITA lab at Cheikh Anta Diop University, Dakar, after serving as first Director of Infrastructure and Information Systems at UVS (2013-2017). With PhDs in Applied Mathematics (UGB) and Telecommunications (UCAD), he researches innovative telecom services for virtual organizations.