

# Global Ranking of Heterogeneous Mobile Network Coverage

**Mbemba HYDARA\***, **Ahmed Dooguy KORA\*\***, **Antoine GNANSOUNOU\*\***

*\*Department of Computer Science, University of Gaston Berger, Saint Louis, Senegal*

*\*\* Ecole Supérieure Multinationale des Télécommunications (ITU Centre of Excellence), BP 10 000, Dakar, Sénégal*

*hydara777@gmail.com, Ahmed.kora@esmt.sn, Antoine.gnansounou@esmt.sn*

**Abstract**—With mobile technologies and networks changing from homogeneous to heterogeneous architecture, the need to objectively evaluate quality of coverage and global ranking approaches is important. This paper proposes a new methodology for assessing global coverage of multi-technology mobile networks. The goal is to determine global degree of appreciation of the level of coverage of a given operator public network. The proposed approach examined existing methods, analysed their strength and limitations and compare against selected case studies (survey data). Three cases of radio coverage have been considered with appropriate formulas introduced. These are coverages of combined technologies over the same territory, combined technologies over same population, and combined technologies aggregating both territory and population. Mathematical model was used to calculate the combined coverage ratings. The result shows that the new proposed global assessment methodology is unified, objective and representative, and may serve as useful tool in decision making for both mobile operators and regulatory authorities.

**Keyword**— Assessment, Coverage, Mobile Network, QoS Ranking



**Mbemba HYDARA** is currently a PhD student in Computer Science with the University of Gaston Berger in Senegal. In 1998 – 2000, He graduated with advanced Diploma in Telecommunications and Networking with the Gambia Technical Training Institute. In 2003 and 2010, he respectively received double Masters Degrees in International Law and Computer Forensics & Security with University of Derby in the United Kingdom (UK). He is an Information Systems lecturer in the University of The Gambia and a registered IRCA - ISMS Auditor/Lead Auditor. His current research work is in the area of Telecommunications Quality Audit.



**Ahmed D. KORA** is a graduate in Physics Sciences in 1998 from “Faculté des Sciences Techniques” at “Université d’Abomey-Calavi”, Bénin, where he got his Diplôme d’Etude Approfondie (DEA) in Material Sciences in 2000. In 2003, he received a Master “Réseaux Télécoms” degree from “Ecole Supérieure Multinationale des Télécommunications” (ESMT) and Ph.D. degree in telecommunication from the University of Limoges, France, in 2007. He is currently with the ESMT in charge of coordinating the Graduate Program in Telecommunications named INGC. His research area covers communication and networks system architecture, open network management solutions, low cost IT systems for development, etc.



**Antoine GNANSOUNOU** is a graduate in Mathematics from “Faculté des Sciences techniques” at “Université d’Abomey - Calavi”, Benin where he received his “Maîtrise ès Sciences Mathématiques” in 1991. In 2000, he received a “Réseaux Télécoms” master degree from “Ecole Supérieure Multinationale des Télécommunications” (ESMT) and in 2007 a master of Research in complex systems simulation, Telecommunications at “Université Cheick Anta Diop de Dakar (UCAD)”.