



UNIVERSITY of
RWANDA

College of Science and Technology

Africa Center of Excellence in Internet of Things (ACEIoT)

Research Seminar

Offline Prediction of Cholera in Rural Communal Tap Waters Using Edge AI inference

Abstract:

Africa accounts for 54% of the world disease burden due to the lack of access to safe drinking water, with the majority of rural area populations or endemic zones getting access to water through potentially unsafe communal water taps.

Unfortunately the expensive laboratory processes and resources used in water processing centers to detect water-borne diseases like cholera cannot be massively deployed on all those taps to guarantee safe water for everyone, anywhere at any time. Thanks to the integration of Internet of Things (IoT) and Artificial Intelligence (AI), the prediction of water-borne cholera can be done by monitoring water's physicochemical patterns. However, related state of the art IoT/AI solutions rely on a cloud-centric architecture with edge water parameter sensors sending collected data to the cloud for inference. Unfortunately, anytime wireless connectivity is not always guaranteed in rural areas, but also it is very consuming in terms of energy for a system expected to run several years without maintenance.

Last but not least, low latency detection is mandatory to warn the tap user on time. This paper presents a prototyping design and development of an offline edge AI rapid water-borne cholera detector kit pluggable into existing taps to lower the cost of mass deployment. Our simulation results in an embedded context show a good accuracy of edge inference with respect to cloud inference



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DATE & TIME:

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10:00 AM to 11:00 AM