ACEIoT

UNIVERSITY of RWANDA
College of Science and Technology

Africa Center of Excellence in Internet of Things (ACEIoT)

Research Seminar

A LoRa enabled IoT-based Air Quality Monitoring System for Smart City

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Abstract:

Keeping key air pollutants below the World Health Organization recommended limits is important for combating the ever-increasing deaths resulting from the associated health problems. This is especially true for indoor environments where poor ventilation can magnify the effects of air pollution. Having Knowledge about the level of pollutants in the air would serve as a stepping stone to take mitigation measures. In this work, a domesticated air pollution monitoring system over the LoRa enabled Internet of Things framework is proposed. Two sensors for CO 2 and PM 2.5 that are important for air quality monitoring with compensated weather monitoring capabilities were deployed in the cafeteria kitchen and laboratory room of the University of Rwanda, College of Science and Technology. The sensed parameter readings are then sent to the cloud via LoRaWAN protocol supported gateway that interfaces the sensors and the cloud part of the network. The end users can query the system and access the data together with the analytic information via the developed Web-based user interface dashboard. An analysis of the data over a period of eleven (11) months is carried out and results show high parts per million of CO 2 of over 800 ppm and PM 2 . 5 concentration of over 100 ppm in the kitchen environment. Whilst a concentration of 500 ppm for CO 2 and zero ppm for PM 2 . 5 were observed in the laboratory room. Baseline algorithms that facilitate setting of triggers for each sensing node and pushing of notifications for when a measured parameter exceeds a certain threshold value are proposed and implemented