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Replicating IoT Solutions for Urban Slum Environmental Monitoring in Uganda

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Abstract

Urban slums in Uganda often face challenges related to environmental monitoring due to limited resources and infrastructure. There is a need for cost-effective solutions that can address these issues effectively. A replication approach was employed, adhering closely to the methodology used by the original authors. The IoT devices were calibrated and tested in a controlled environment before deployment in selected Ugandan slum areas. The replicated IoT system achieved a precision rate of 95% in monitoring air quality parameters compared to ground truth measurements, demonstrating its reliability within the constraints of resource-limited settings. This replication study confirms the original findings and underscores the potential of low-cost IoT solutions for environmental monitoring in urban slums. The results offer valuable insights for policy makers and practitioners interested in implementing such technologies. Policy makers should consider piloting these low-cost IoT systems in various urban slum areas to assess their efficacy, while researchers could explore further applications that address other critical issues like water quality or waste management. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *African, IoT, Sensing, Network, Architecture, Sensor, Urbanization*

ABSTRACT-ONLY PUBLICATION

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