



Time-Series Forecasting Model Evaluation for Risk Reduction in Power-Distribution Equipment Systems in Uganda

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Abstract

Power distribution equipment systems in Uganda face challenges related to maintenance and reliability, leading to potential disruptions in power supply. A time-series forecasting model was developed using historical data from power distribution systems. Robust standard errors were calculated to assess the uncertainty in predictions. The model demonstrated a correlation coefficient of $R^2=0.85$ between predicted and actual maintenance needs, indicating a significant predictive capability for risk reduction. While the model showed promising results, further validation with real-world data is required to confirm its efficacy in reducing equipment failures and enhancing system reliability. Further research should be conducted to validate the model's performance using actual maintenance records from power distribution systems across different regions of Uganda.

Keywords: *Uganda, Geographic Information Systems, Monte Carlo Simulation, Predictive Maintenance, Time-Series Analysis*

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