Artificial Intelligence Enhancements in Public Safety Response Times across Selected Nigerian Cities

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Abstract

Artificial Intelligence (AI) applications in public safety have shown promise in improving response times to emergencies. A comparative analysis was conducted using machine learning techniques, specifically a Random Forest classifier to predict optimal AI model performance based on historical data from five Nigerian cities. Uncertainty quantification is provided through 95% confidence intervals for predictions. AI models demonstrated an average reduction of 20% in response times compared to traditional methods across the selected cities, with significant variance observed between urban and rural settings. The integration of AI significantly improved public safety response times, particularly evident in urban areas. Future research should explore scalability and cost-effectiveness while considering potential ethical implications. Public safety agencies are encouraged to invest in AI infrastructure and training programmes for effective implementation. Ongoing evaluation is necessary to ensure continuous improvement and compliance with legal standards. 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: *Sub-Saharan, Geographic Information Systems, Data Mining, Predictive Analytics, Spatial Databases, Geographic Profiling, Monte Carlo Simulations*

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