



Big Data Analytics in Predictive Policing: An Evaluation of Crime Rate Reduction Strategies in Ghanaian Urban Areas,

Yaw Darko Brewaa¹

¹ Council for Scientific and Industrial Research (CSIR-Ghana)

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Correspondence: ybrewaa@aol.com

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Author notes

Yaw Darko Brewaa is affiliated with Council for Scientific and Industrial Research (CSIR-Ghana) and focuses on Computer Science research in Africa.

Abstract

Predictive policing utilizes big data analytics to forecast crime patterns in urban areas, aiming to enhance law enforcement efficiency and reduce crime rates. The study employed a comparative analysis approach using publicly available crime data from selected urban locations to assess the impact of predictive policing interventions. A significant reduction (34%) in reported crimes was observed where predictive policing strategies were implemented compared to areas without such measures, supporting the efficacy of these analytics in urban settings. Predictive policing appears effective in reducing crime rates in Ghanaian urban environments, with substantial reductions noted where interventions were applied. Ghana should consider expanding and refining predictive policing strategies based on the findings to further mitigate crime effectively. Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{rVert}^2$, with performance evaluated using out-of-sample error.

Keywords: *Geographic, Sub-Saharan, Urbanization, Quantitative Methods, Spatial Analysis, Crime Prevention Theory, Geographic Information Systems*

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