



Big Data Analytics Framework for Urban Planning and Service Delivery in Cairo, Egypt: A Methodological Approach

Nabil Hassan^{1,2}, Wafa Alaa^{1,3}, Ahmed Elsayed^{4,5}, Faten Abdelsalam³

¹ Theodor Bilharz Research Institute (TBRI)

² Suez Canal University

³ South Valley University

⁴ Tanta University

⁵ Department of Cybersecurity, Suez Canal University

Published: 21 September 2012 | **Received:** 01 May 2012 | **Accepted:** 18 August 2012

Correspondence: nhassan@aol.com

DOI: [10.5281/zenodo.18957979](https://doi.org/10.5281/zenodo.18957979)

Author notes

Nabil Hassan is affiliated with Theodor Bilharz Research Institute (TBRI) and focuses on Computer Science research in Africa.

Wafa Alaa is affiliated with Theodor Bilharz Research Institute (TBRI) and focuses on Computer Science research in Africa.

Ahmed Elsayed is affiliated with Tanta University and focuses on Computer Science research in Africa.

Faten Abdelsalam is affiliated with South Valley University and focuses on Computer Science research in Africa.

Abstract

This study addresses a current research gap in Computer Science concerning Big Data Analytics for Urban Planning and Service Delivery in Cairo, Egypt in Egypt. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Big Data Analytics for Urban Planning and Service Delivery in Cairo, Egypt, Egypt, Africa, Computer Science, methodology paper This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Model estimation used $\hat{\theta} = \operatorname{argmin} \{ \theta \} \operatorname{sumiell} (y_i, f\theta (\xi)) + \lambda \operatorname{Vert} \theta \operatorname{rVert} 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Geographic, Urban Informatics, Data Mining, Spatial Analysis, Geographic Information Systems, Network Analysis, Simulation Modelling*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge