African Geometry and Topology (Pure Science)

Matrix Decomposition Theoretical Framework for Traffic Flow Optimization in Uganda: Asymptotic Analysis and Identifiability Checks

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Abstract

Theoretical analysis of matrix decomposition methods for optimising traffic flow in Uganda has not been extensively explored. We employ a theoretical approach with assumptions based on linear algebra principles. Theoretical derivations are conducted using eigenvalue decomposition as a core technique. The theoretical framework established provides a foundation for further empirical studies to validate these findings and inform policy decisions regarding traffic flow optimization. Future research should include simulation models to test the effectiveness of proposed optimizations in real-world scenarios, with a focus on identifying key variables that influence traffic patterns. Model selection is formalised as $\hat{\{\theta\}} = argmin_{\theta in \theta} ¿ L(\theta) + \lambda ¿ \omega(\theta) ¿$ with consistency under mild identifiability assumptions.

Keywords: *Sub-Saharan, Matrix Decomposition, Linear Algebra, Identifiability, Stability Analysis, Optimization Techniques, Network Dynamics*

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