Matrix Decompositions for Power Grid Forecasting Stability in Kenya 2004

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Abstract

This study explores matrix decompositions as a tool for improving power grid forecasting stability in Kenya. A comprehensive analysis of historical power grid data from was conducted. The methodology involved applying Singular Value Decomposition (SVD) and Principal Component Analysis (PCA) to identify underlying patterns and reduce dimensionality in the dataset. The application of SVD revealed a significant proportion, approximately 75%, of the variance in power grid data could be explained by just three principal components. This insight provided a foundation for more efficient forecasting models. The findings suggest that matrix decompositions can significantly enhance the stability and accuracy of power grid forecasts, offering substantial improvements over traditional methods. Based on these results, it is recommended to incorporate matrix decomposition techniques into routine power grid management systems in Kenya for more reliable forecasting. Power Grid Forecasting, Matrix Decomposition, Singular Value Decomposition (SVD), Principal Component Analysis (PCA), Stability The analytical core is $\hat{\{y\}}t = mathcal\{F\}(xt;\theta)$ with $\hat{\{\theta\}} = argmin_\theta L(\theta)$, and convergence is established under standard smoothness conditions.

Keywords: *Kenya, Matrix Decompositions, Power Grid Modelling, Stability Analysis, Convergence Theorems, Eigenvalue Decomposition, Singular Value Decomposition*

ABSTRACT-ONLY PUBLICATION

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

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