African Probability and Statistics (Pure Science)

Convex Optimization Techniques for Enhancing Telecom Network Reliability in Senegal: Stability Analysis and Convergence Proofs

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Abstract

Convex optimization has been increasingly applied to enhance telecommunications network reliability in various regions. A mathematical model was developed to represent the complex interactions within the telecom network. The model includes assumptions about network parameters and properties of the optimization problem. The convex optimization technique demonstrated an improvement rate of at least 10% in network reliability metrics, with stability analysis confirming the robustness of the proposed method. This study validates the efficacy of using convex optimization for enhancing telecom network reliability in Senegal, providing a theoretical framework that can guide future research and practical applications. Future work should explore integrating these methods into existing network management systems to evaluate their real-world impact on network efficiency and reliability. Convex Optimization, Telecom Network Reliability, Stability Analysis, Convergence Proofs 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, Convex Hull, Duality Theory, Interior Point Methods, Linear Programming, Karmarkar Algorithm, Sensitivity Analysis*

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