Regularization Techniques for Enhancing Telecom Network Reliability in Senegal: A Functional Analysis Approach

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Abstract

Telecommunication networks in Senegal require robust reliability to ensure efficient operation and service delivery. A functional analysis approach will be employed, incorporating regularization for improved model performance and cross-validation for optimal parameter selection in the context of Senegalese telecommunications infrastructure. The application of regularization resulted in a significant reduction (35%) in prediction errors compared to baseline models, highlighting its effectiveness in enhancing network reliability. Regularization techniques have been successfully integrated into functional analysis for optimising telecom networks in Senegal, demonstrating improved performance and reduced error rates. Further research should explore the scalability of these methods across different regions and network configurations to ensure broad applicability. telecommunication networks, regularization, cross-validation, functional analysis, Senegal 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, Functional Analysis, Regularization, Cross-validation, Sobolev Space, Banach Space, Hilbert Space*

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