17. EVALUATION OF MACHINE LEARNING MODELS FOR 5G COVERAGE PREDICTION: KEY FEATURE SELECTION AND ACCURACY ANALYSIS

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The rapid deployment of 5G networks has necessitated accurate coverage prediction models to ensure optimal network planning and resource allocation. This study conducts a comparative analysis of various machine learning algorithms for 5G coverage prediction, emphasizing the identification of dominant feature parameters that significantly impact prediction accuracy. Several supervised learning models, including Decision Trees, Random Forest, Support Vector Machines, and Artificial Neural Networks, are evaluated based on their performance metrics such as accuracy, precision, recall, and computational efficiency. Feature importance analysis is performed to determine the most influential parameters affecting 5G signal propagation. The results indicate that ensemble-based models outperform traditional algorithms, offering higher accuracy and robustness in diverse environmental conditions. This research provides insights into selecting the most effective machine learning model for 5G coverage prediction, contributing to enhanced network planning and optimization.

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