

Machine Learning Using Random Forest Model for Financial Data Prediction

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Abstract – Data-driven predictive models are becoming popular across the financial institutions in assessing risks, predicting trends, identifying anomalies and tailoring customer services. Financial datasets are nonlinear and high-dimensional which frequently prove difficult to handle using traditional statistical models. The machine learning (ML) algorithms and especially the ensemble models such as the random forest (RF) modeling provide both resistant power and tolerance to noise. The paper is research on the effectiveness of the Random Forest model in financial data prediction with special focus on predicting trends in stocks, credit risk, and selecting anomalies in the data of transactions. It is compared to the models of the Logistic Regression, Support Vector Machines (SVM), and Gradient Boosting. The experimental settings prove that the achieved accuracy and stability are higher than those of deep learning models on small-to-medium-sized datasets, and interpretability rates do not decrease with the use of Random Forest. The paper also parallels the applications of Generative AI to banking customer support, parameter optimization in deep learning, GAN based synthetic medical imaging, supervised ML in educational analytics, and deep learning-based anomaly detection making Random Forest a viable but effective instrument in financial analytics.

Keywords – Deep Learning, Gradient Boosting, Machine Learning, Random Forest, Support Vector Machines.