

An Explainable AI System for Fraud Identification in Insurance Claims via Machine-Learning Methods

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Abstract: *The estimation of insurance claims/fraud detection is significant to the stability and efficiency of the insurance industry. Effective estimation of claims assists the insurers in estimating risks more effectively, and cover compensation as fast as possible, and preventing fraud would prevent huge losses of finances that could undermine the stability of the world economies and the effectiveness of the capital markets. Trying to deal with these problems, the research paper discusses the application of the science of artificial intelligence (AI) in order to predict insurance claims with regard to accuracy, interpretability and decision-making support. On the basis of organized medical data, the given XGBoost algorithm was used to construct a strong predictive model. The experimental results show that the XGBoost model has a high performance with an accuracy of 98.78% which is much better than the traditional models, which incorporate the Logistic Regression (LR), AdaBoost and Naive Bayes (NB) models. In addition to that, with the introduction of explainable AI(XAI) approaches, including SHAP and LIME, the level of transparency is enhanced because it shows the role that potentially important features play in model forecasts. These findings confirm that integrating advanced machine learning (ML) with interpretability not only ensures predictive reliability but also fosters stakeholder trust, offering a scalable and practical framework for mitigating fraud and enhancing operational efficiency in insurance analytics.*

Keywords: Insurance claim prediction, fraud detection, machine learning, explainable AI (XAI), healthcare analytics, XGBoost