MAJOR PROJECT
OPTIMIZING EMPLOYEE RETENTION WITH DEEP LEARNING-ENHANCED ATTRITION FORECASTING

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ABSTRACT

  Employee attrition presents a formidable challenge for organizations, impacting both productivity and financial stability, with traditional statistical methods often inadequate in capturing its complex nature. This study pioneers an advanced predictive framework that synergistically integrates Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks to elevate the accuracy of attrition forecasts. The innovative hybrid model leverages CNNs' proficiency in uncovering intricate feature interactions alongside LSTMs' capability to model temporal data sequences, thereby delivering a sophisticated analysis of attrition dynamics. Employing an advanced preprocessing pipeline and rigorous evaluation metrics—such as accuracy and ROC-AUC—the model surpasses conventional techniques, offering human resources departments actionable insights to precisely identify high-risk employees and implement targeted retention strategies, thereby enhancing overall workforce stability

KEYWORDS: Deep Learning, Convolutional Neural Networks(CNNs), Long Short-Term Memory(LSTM), Predictive Modeling, Hybrid Models, Hybrid Models, ROC-AUC, Advanced Preprocessing, Accuracy Metrics, Temporal Data Analysis, Attrition Forecasting, HR Analytics, Employee Attrition, Workforce Stability, Retention Strategies, Feature Engineering

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