

# Credit Card Fraud Detection using Machine Learning Algorithm

Suraj Sahane<sup>1</sup>, Saksham Kamble<sup>2</sup>, Taneeshka Polekar<sup>3</sup>, Viraj Kamble<sup>4</sup>, Punam Sawale<sup>5</sup>

Students, Department of Computer Engineering<sup>1,2,3,4</sup>

Professor, Department of Computer Engineering<sup>5</sup>

Smt. Kashibai Navale College of Engineering, Pune, India

**Abstract:** The rapid growth of online transactions has led to an increase in credit card fraud, posing significant challenges to financial institutions and consumers. In this study, we propose a robust credit card fraud detection system utilizing machine learning algorithms, specifically Support Vector Machine (SVM) and Random Forest. The dataset used in this research consists of a comprehensive collection of credit card transactions, including both legitimate and fraudulent activities. Feature engineering techniques are employed to extract relevant information from the dataset, such as transaction amount, location, time, and type. we implement SVM and Random Forest classifiers to train and evaluate the model's performance in detecting fraudulent transactions. SVM is known for its effectiveness in handling high-dimensional data and finding optimal decision boundaries, while Random Forest excels in handling large datasets with high variability. the evaluation of the proposed models is conducted using standard metrics such as precision, recall, and F1-score. Additionally, we employ techniques such as cross-validation to ensure the robustness of the models and avoid overfitting. experimental results demonstrate the effectiveness of both SVM and Random Forest in accurately identifying fraudulent credit card transactions. Furthermore, ensemble techniques such as bagging and boosting could potentially enhance the performance of the classifiers further. the proposed credit card fraud detection system provides a practical solution for financial institutions and e-commerce platforms to mitigate the risks associated with fraudulent activities. By leveraging machine learning algorithms such as SVM and Random Forest, it offers an efficient and scalable approach to safeguarding financial transactions in the digital era

**Keywords:** SVM Algorithm, Kernel, Detection, Fraud, Social Impact, Finances, Random Forest Algorithm