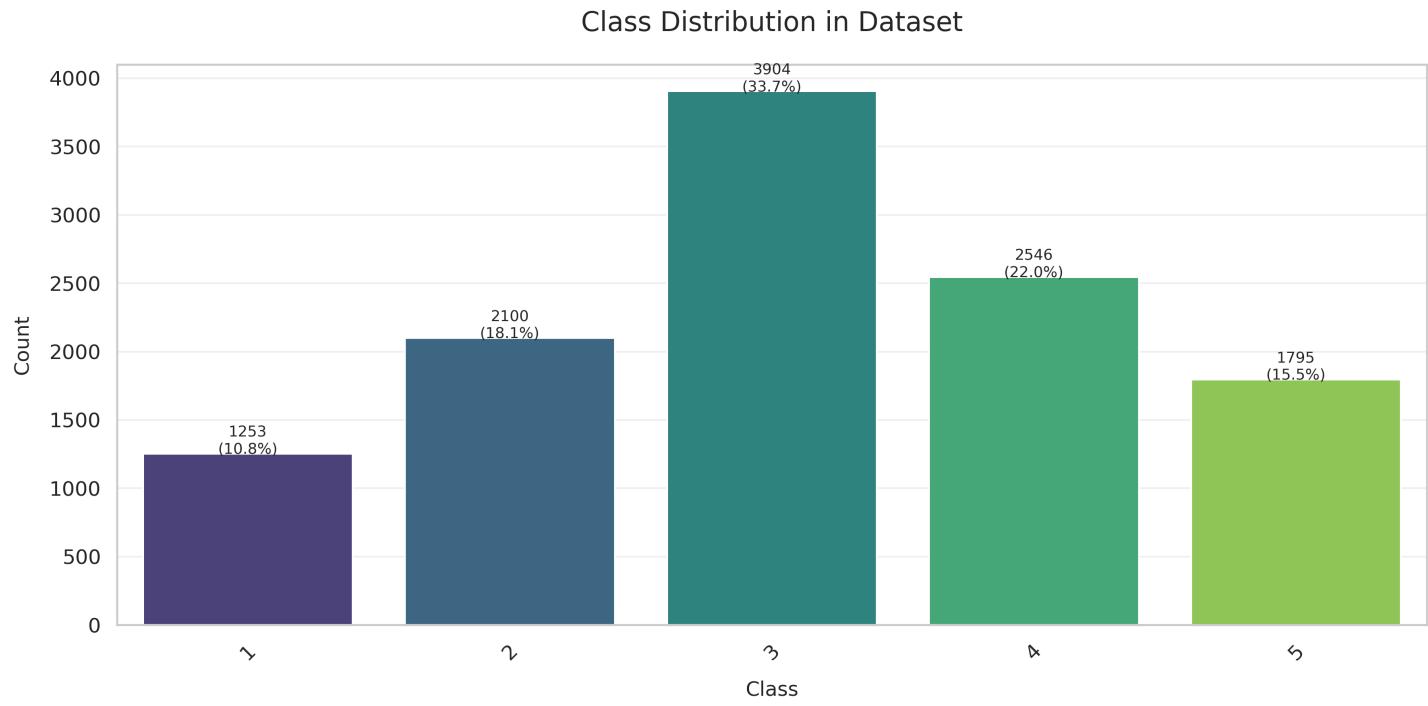


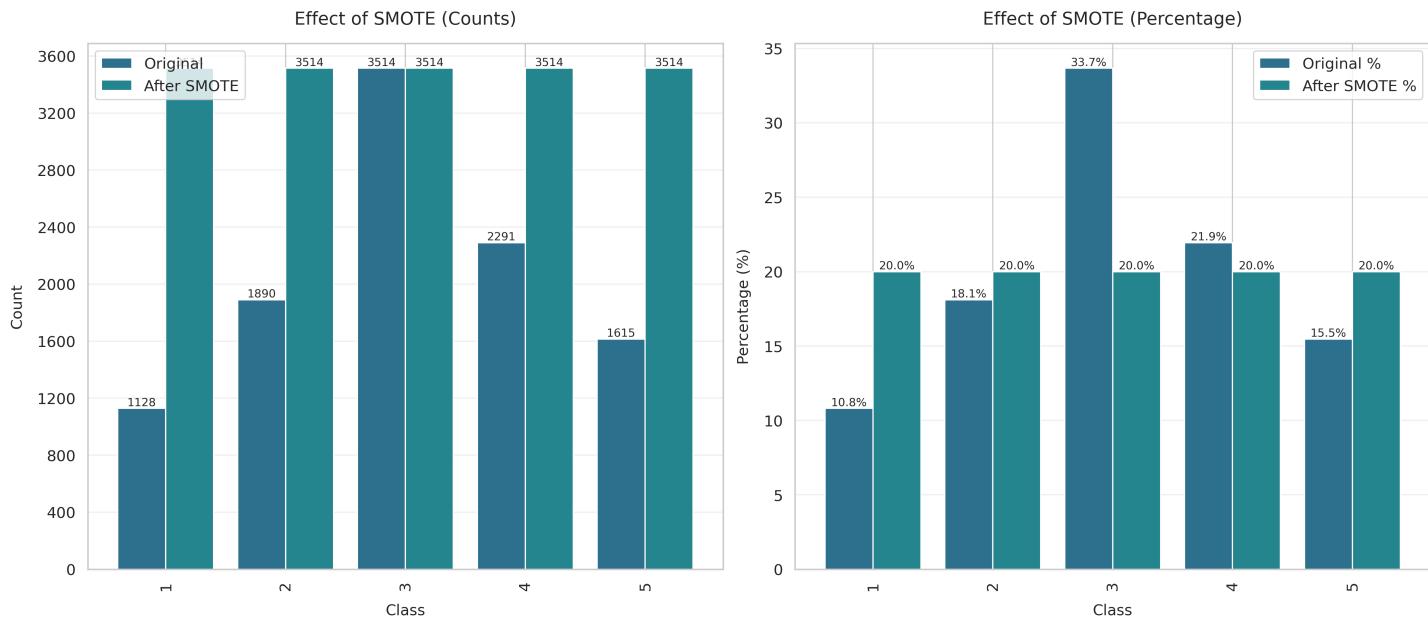
Machine Learning Analysis for Syscalls Classification

Comprehensive Visualization Report

Class Distribution

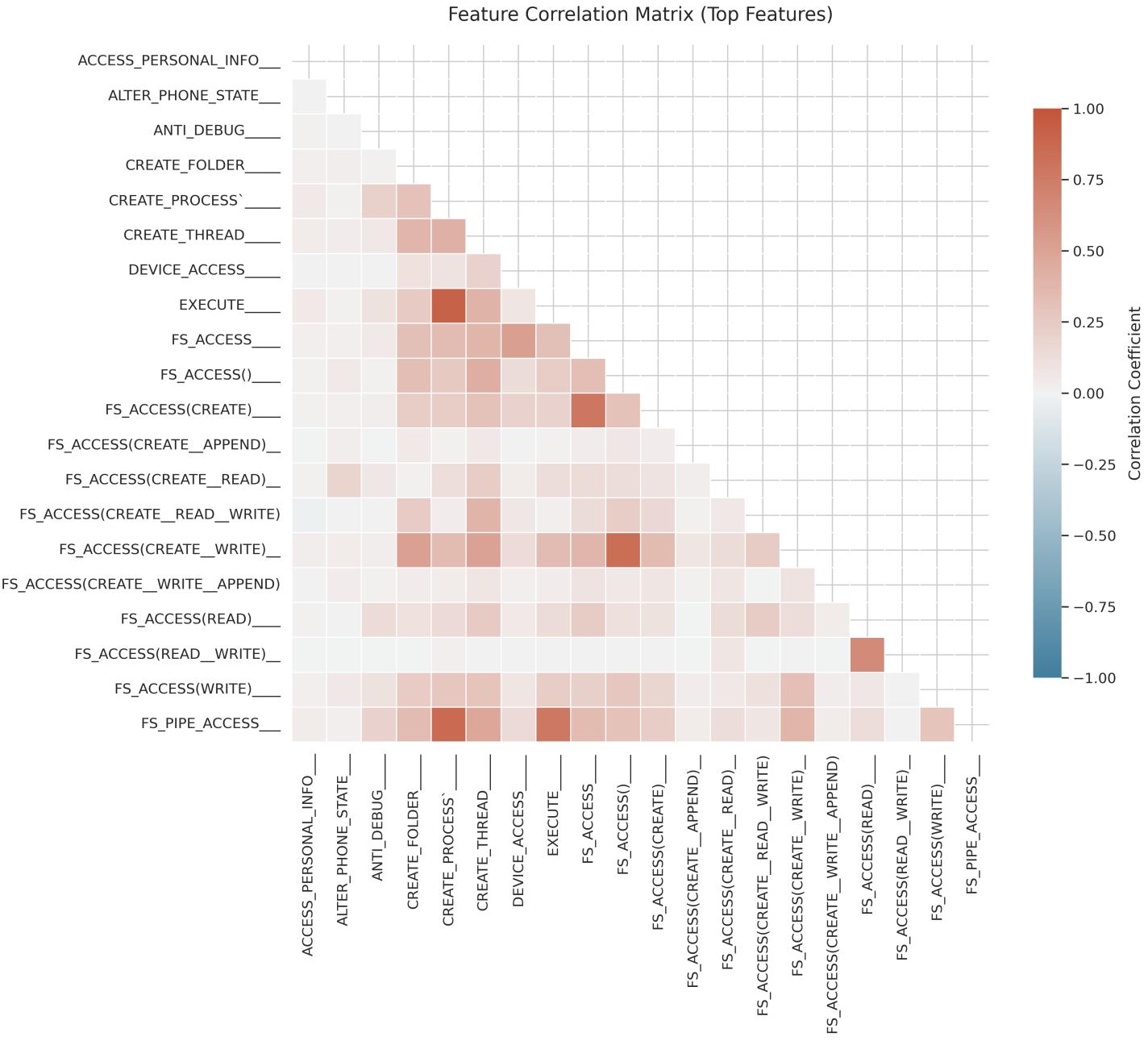


Effect of SMOTE Oversampling



Machine Learning Analysis for Syscalls Classification

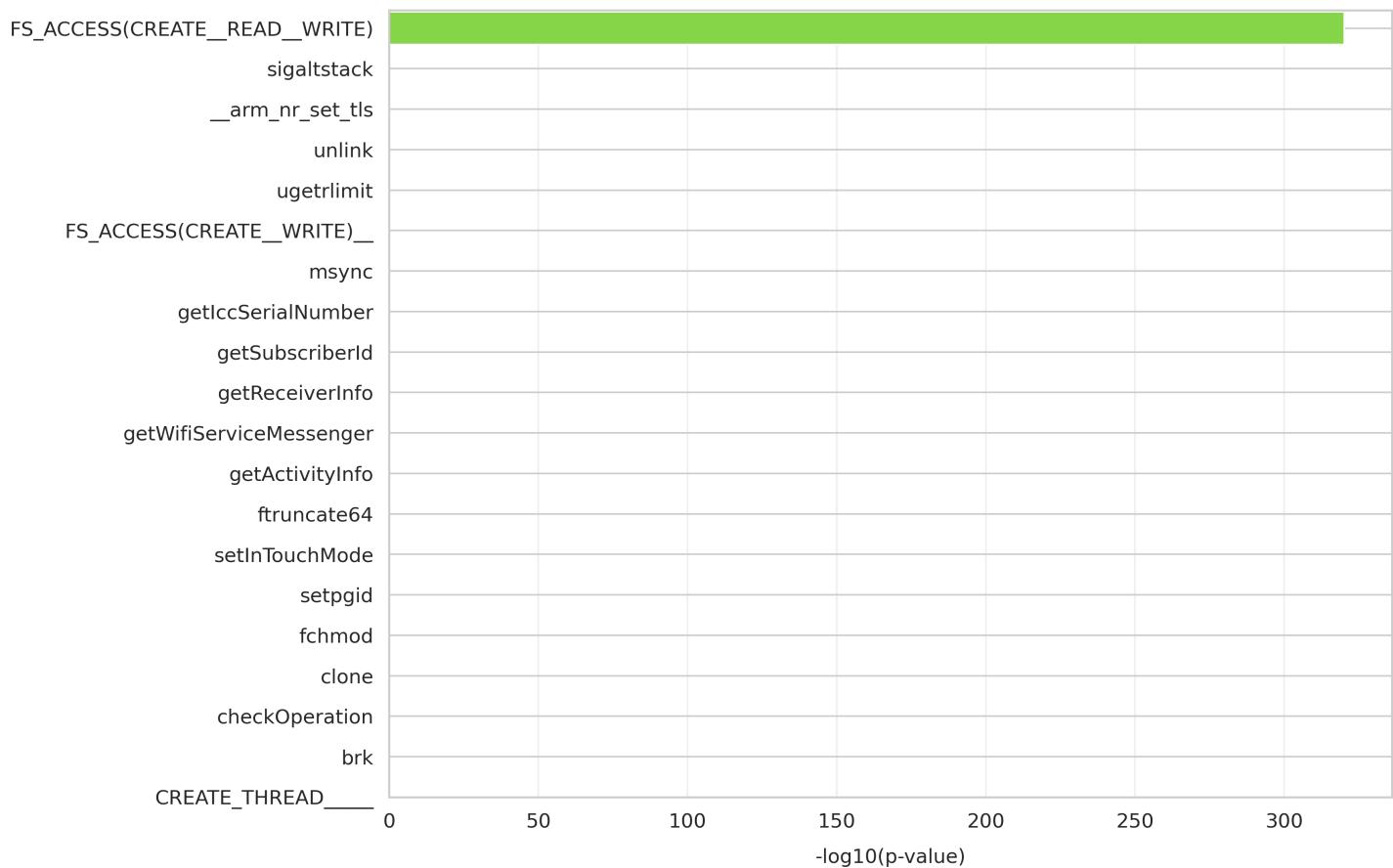
Feature Correlation Matrix



Feature Importance Analysis

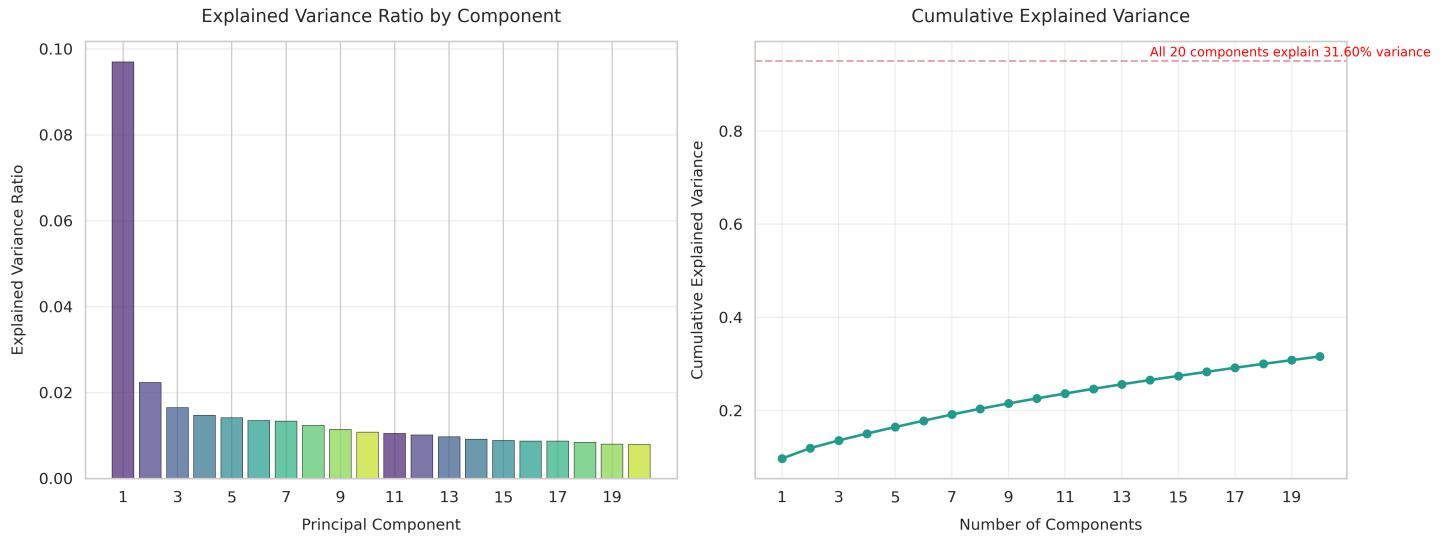
Machine Learning Analysis for Syscalls Classification

Top Feature Importance (ANOVA F-value)

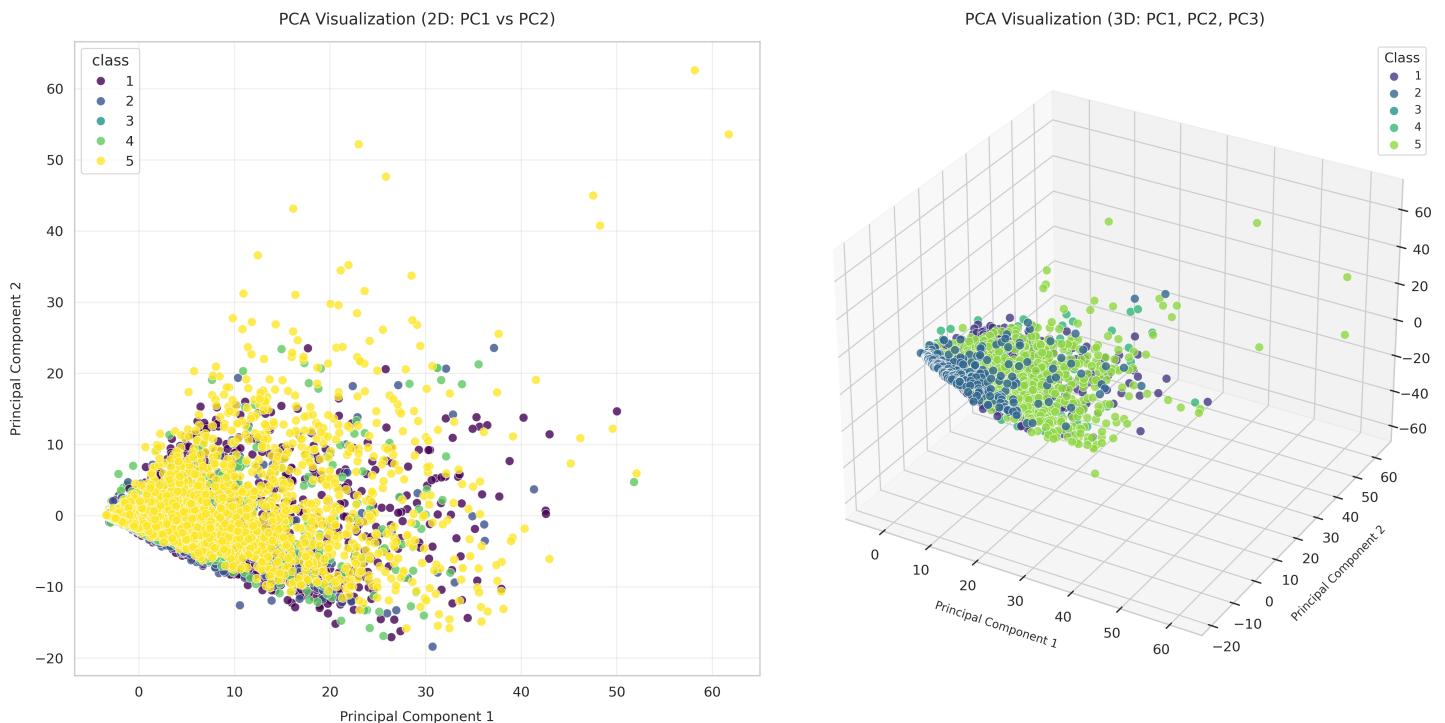


Machine Learning Analysis for Syscalls Classification

PCA Explained Variance



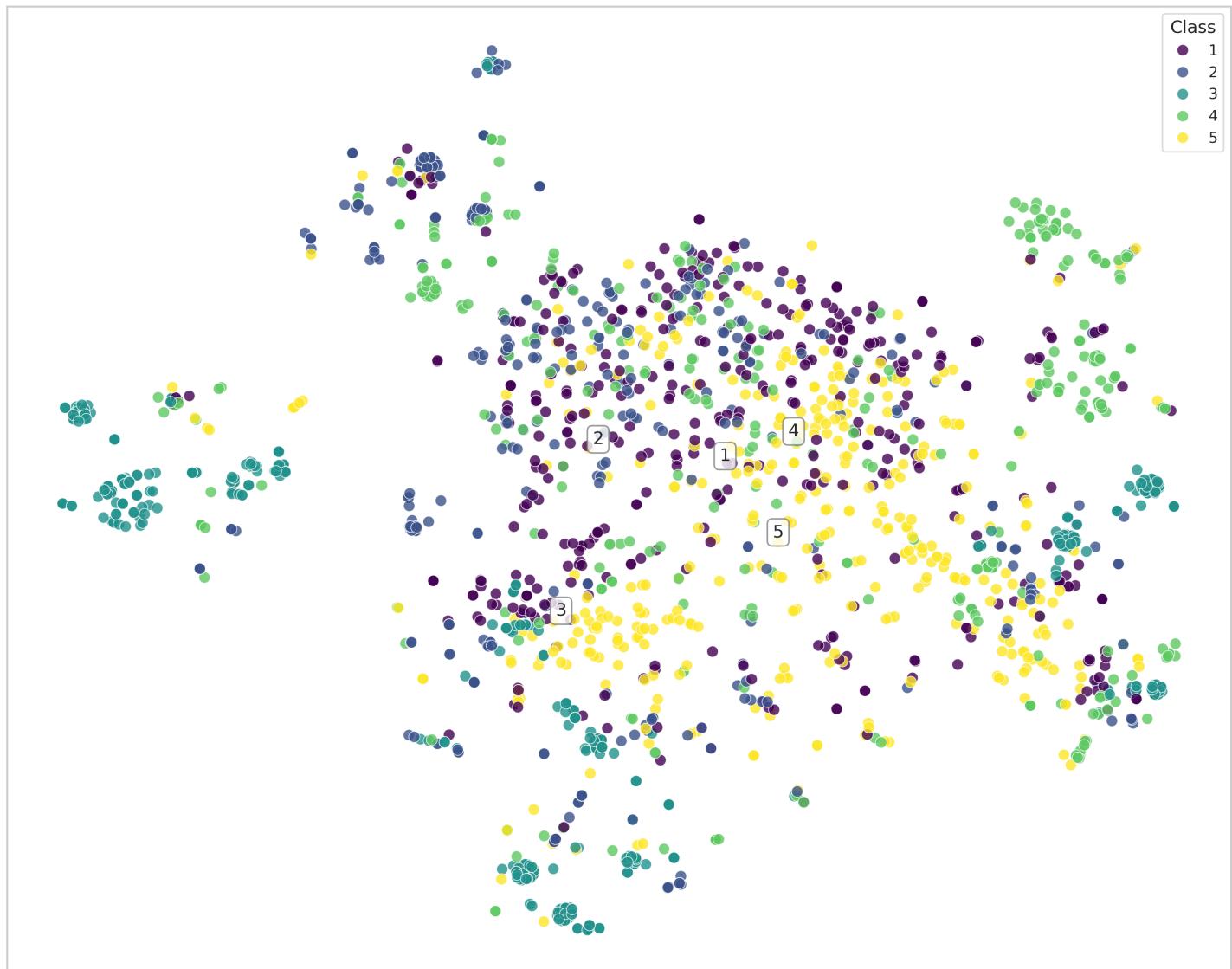
PCA Visualization



Machine Learning Analysis for Syscalls Classification

t-SNE Visualization

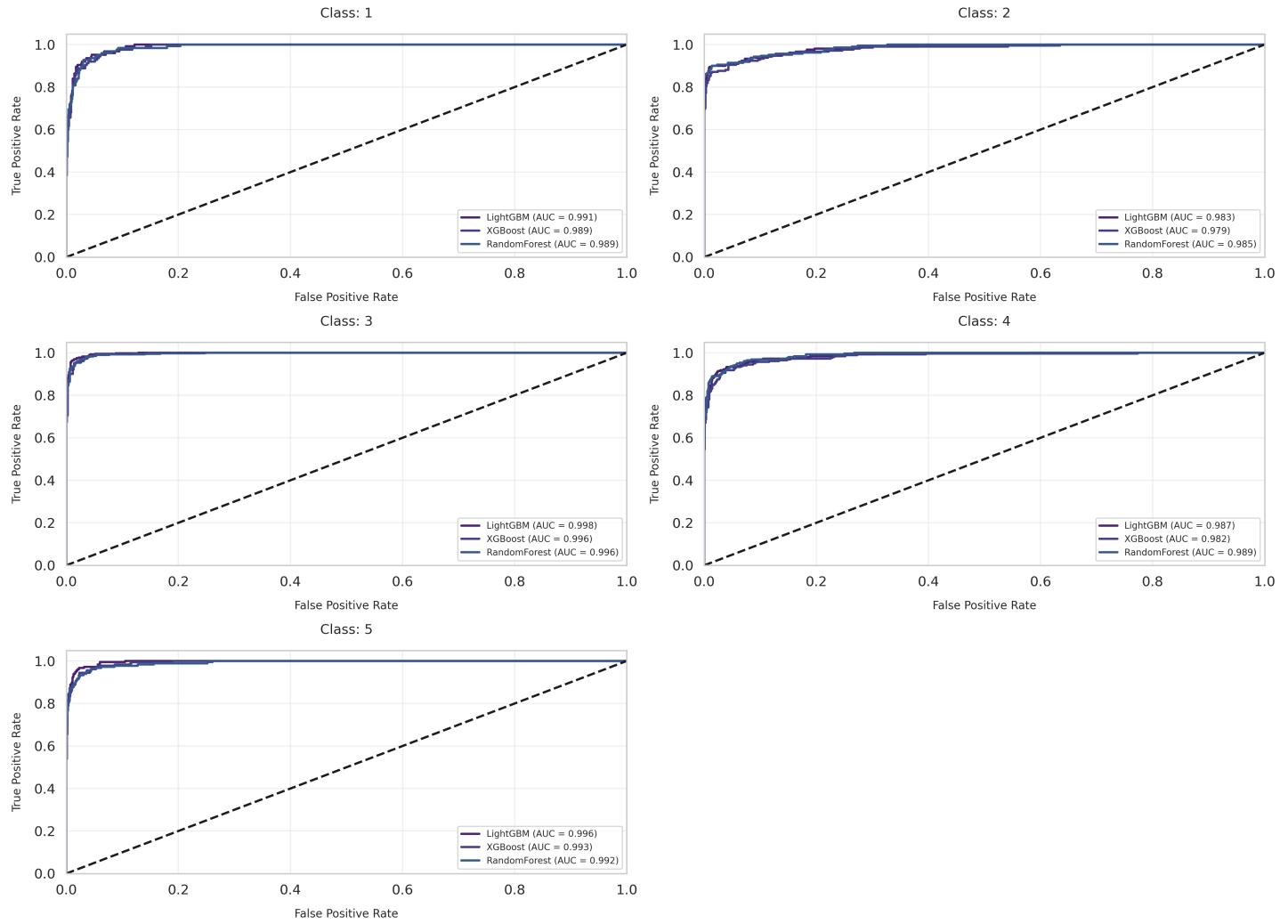
t-SNE Visualization of Training Data (after SMOTE)



ROC Curves

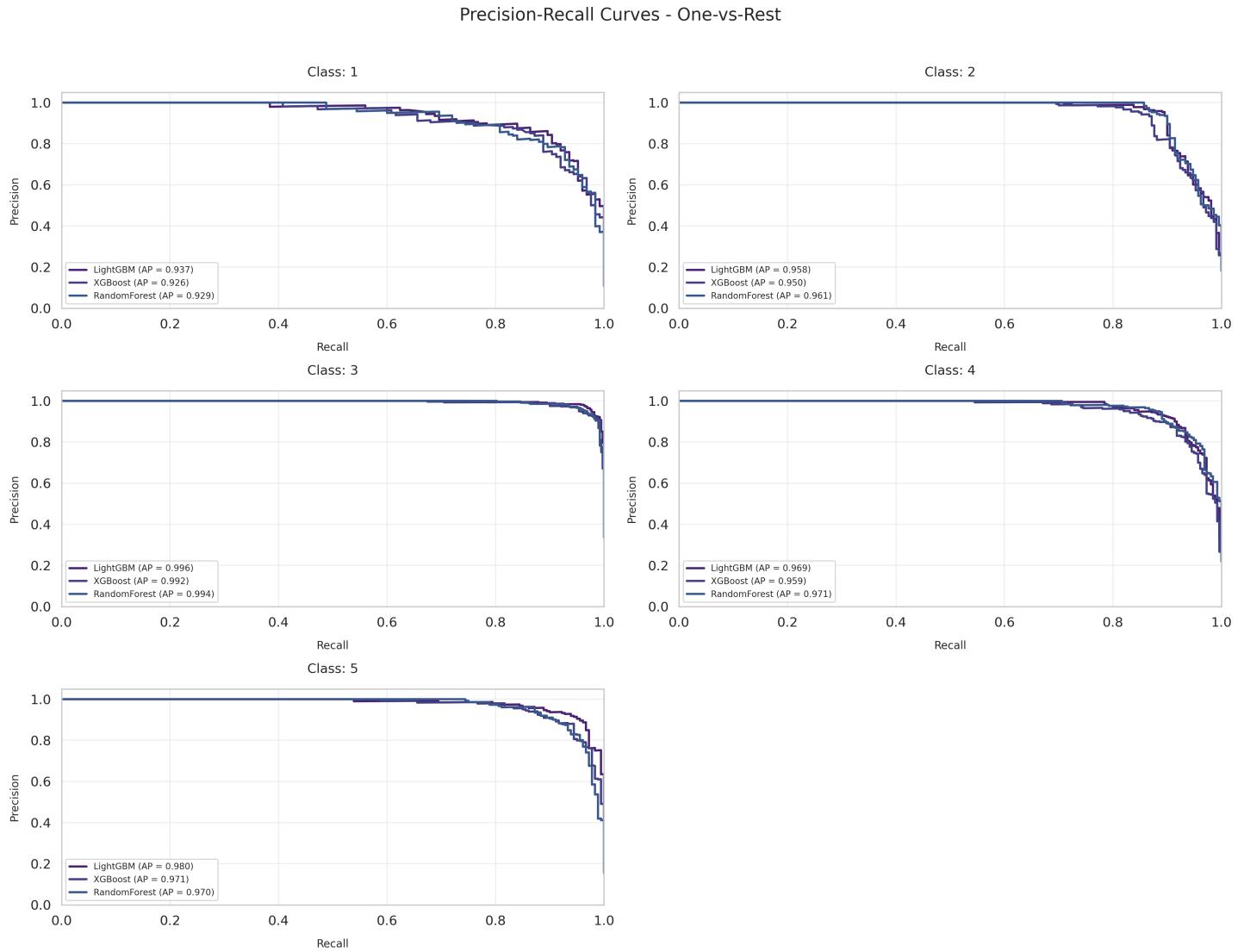
Machine Learning Analysis for Syscalls Classification

ROC Curves - One-vs-Rest



Machine Learning Analysis for Syscalls Classification

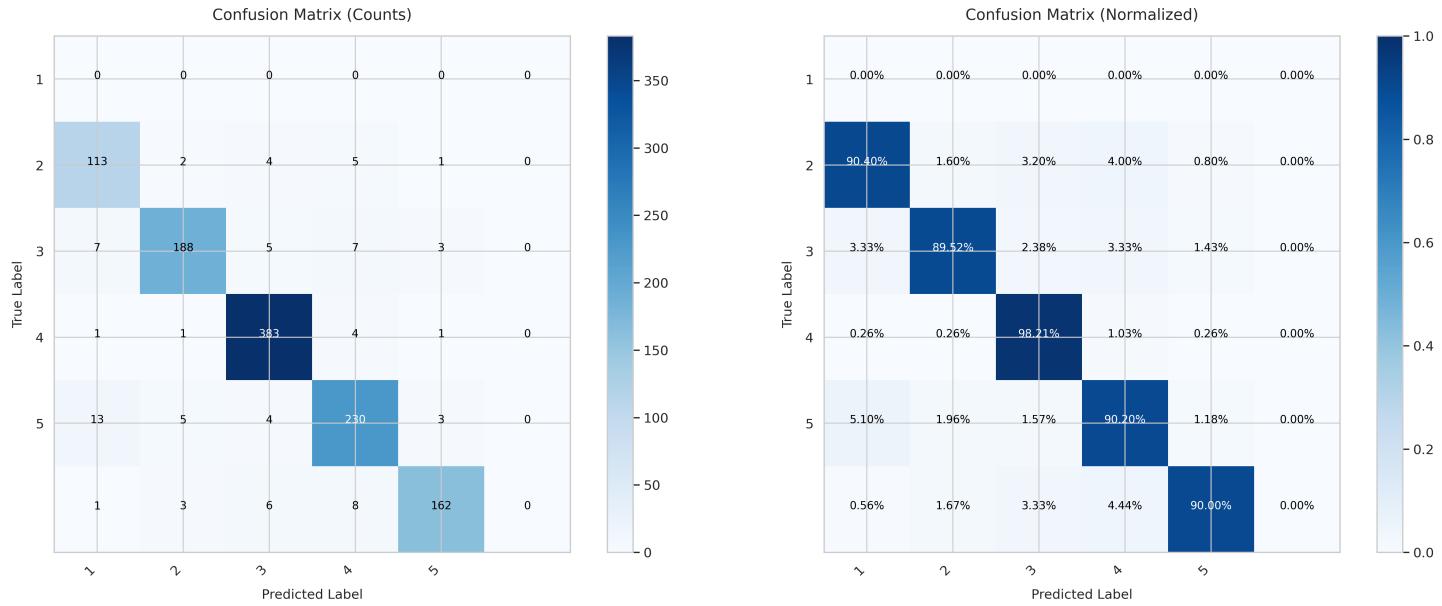
Precision-Recall Curves



Confusion Matrix - LightGBM

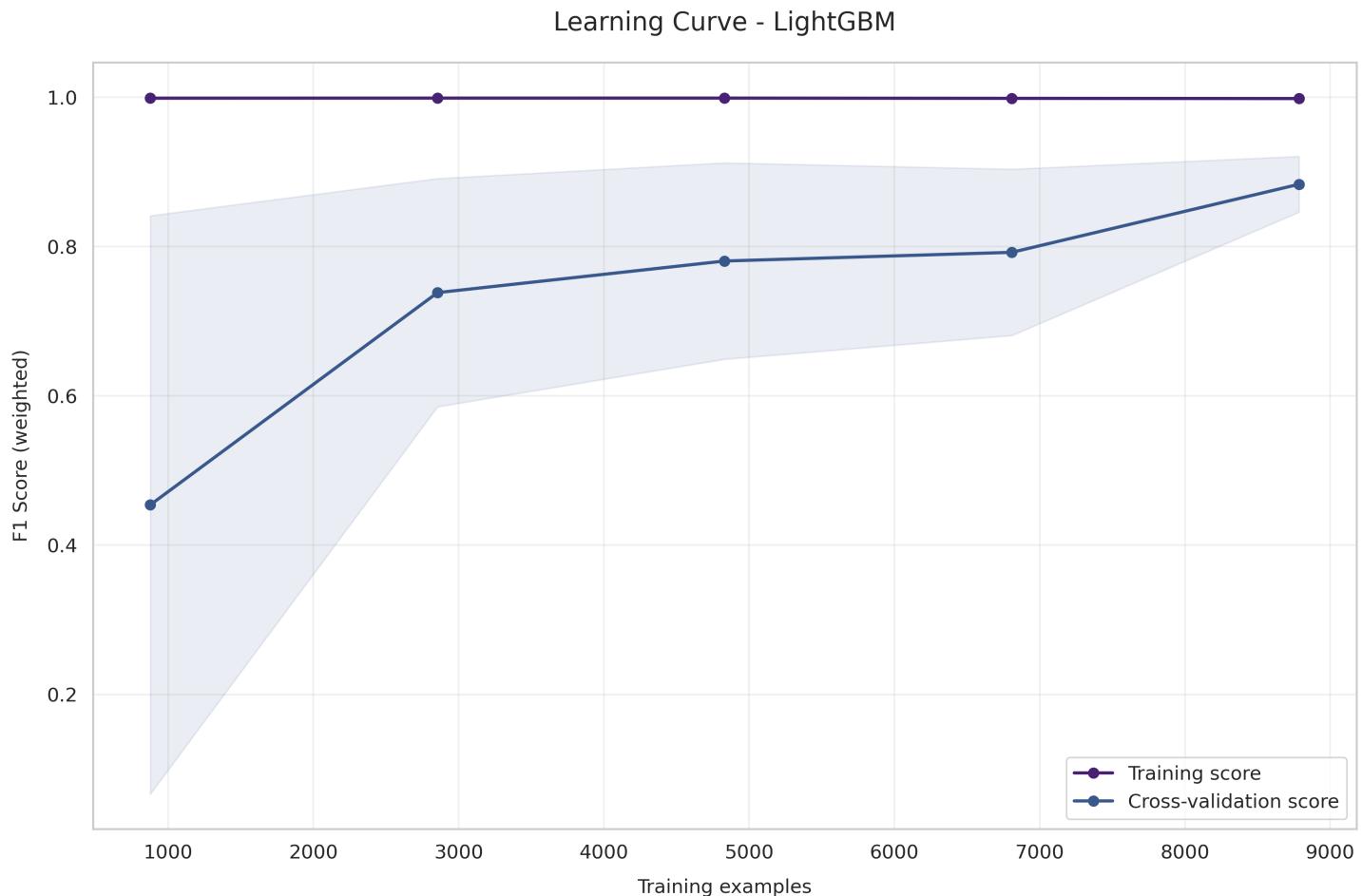
Machine Learning Analysis for Syscalls Classification

Confusion Matrix - LightGBM



Machine Learning Analysis for Syscalls Classification

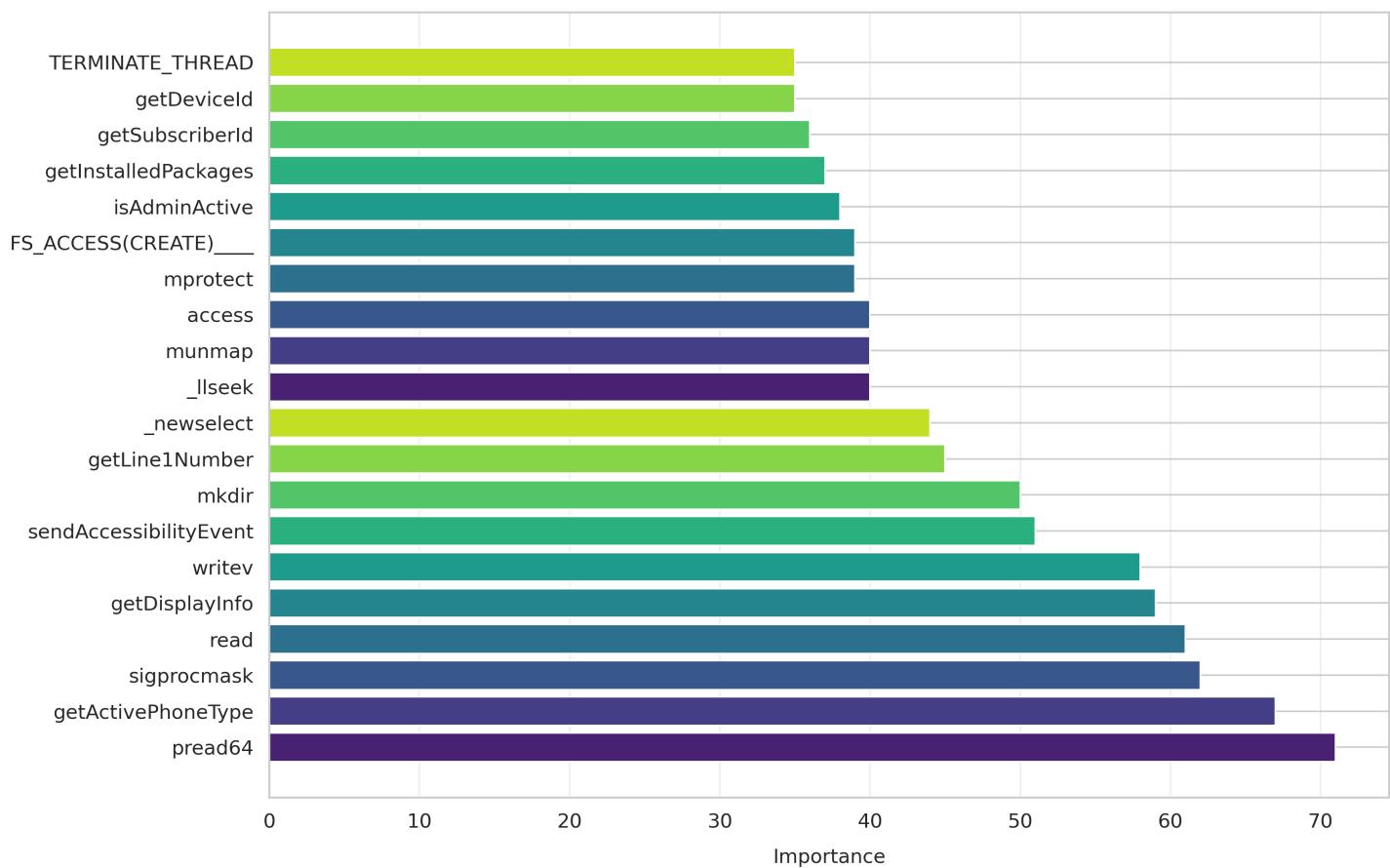
Learning Curve - LightGBM



Feature Importance - LightGBM

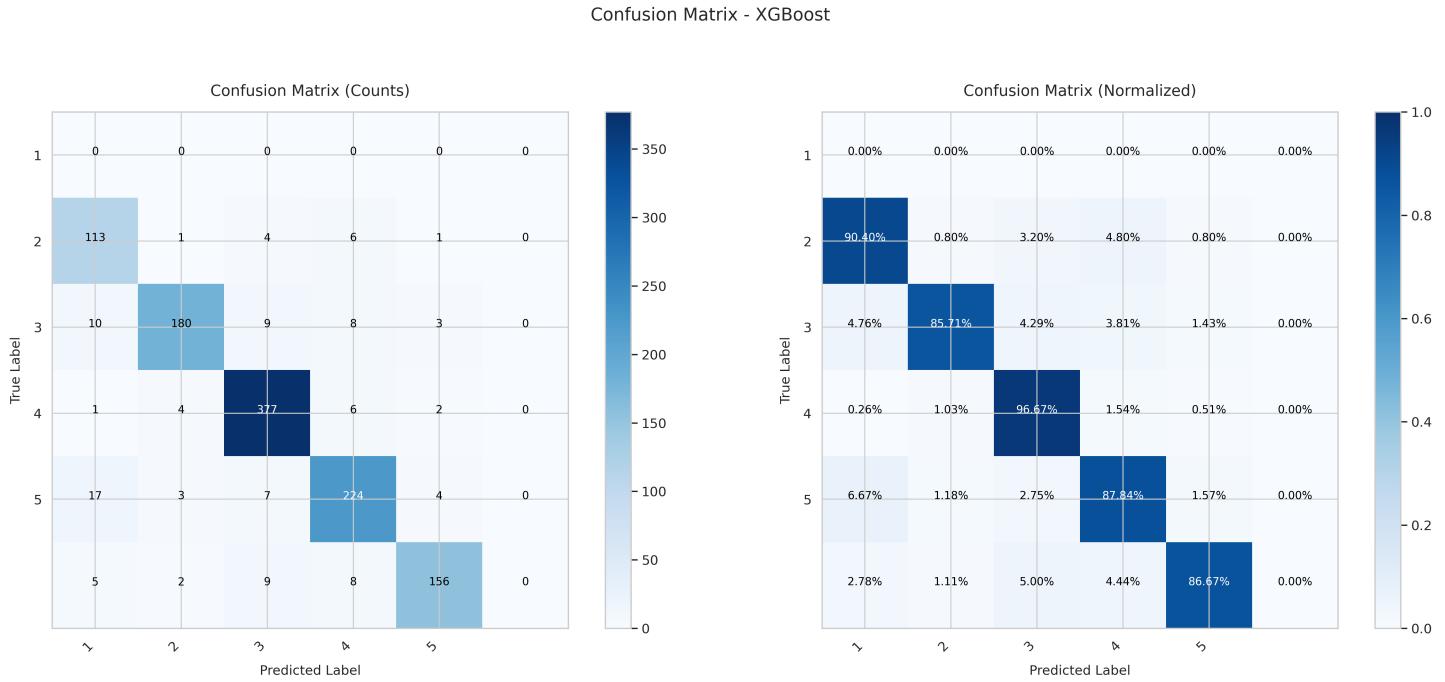
Machine Learning Analysis for Syscalls Classification

Feature Importance - LightGBM

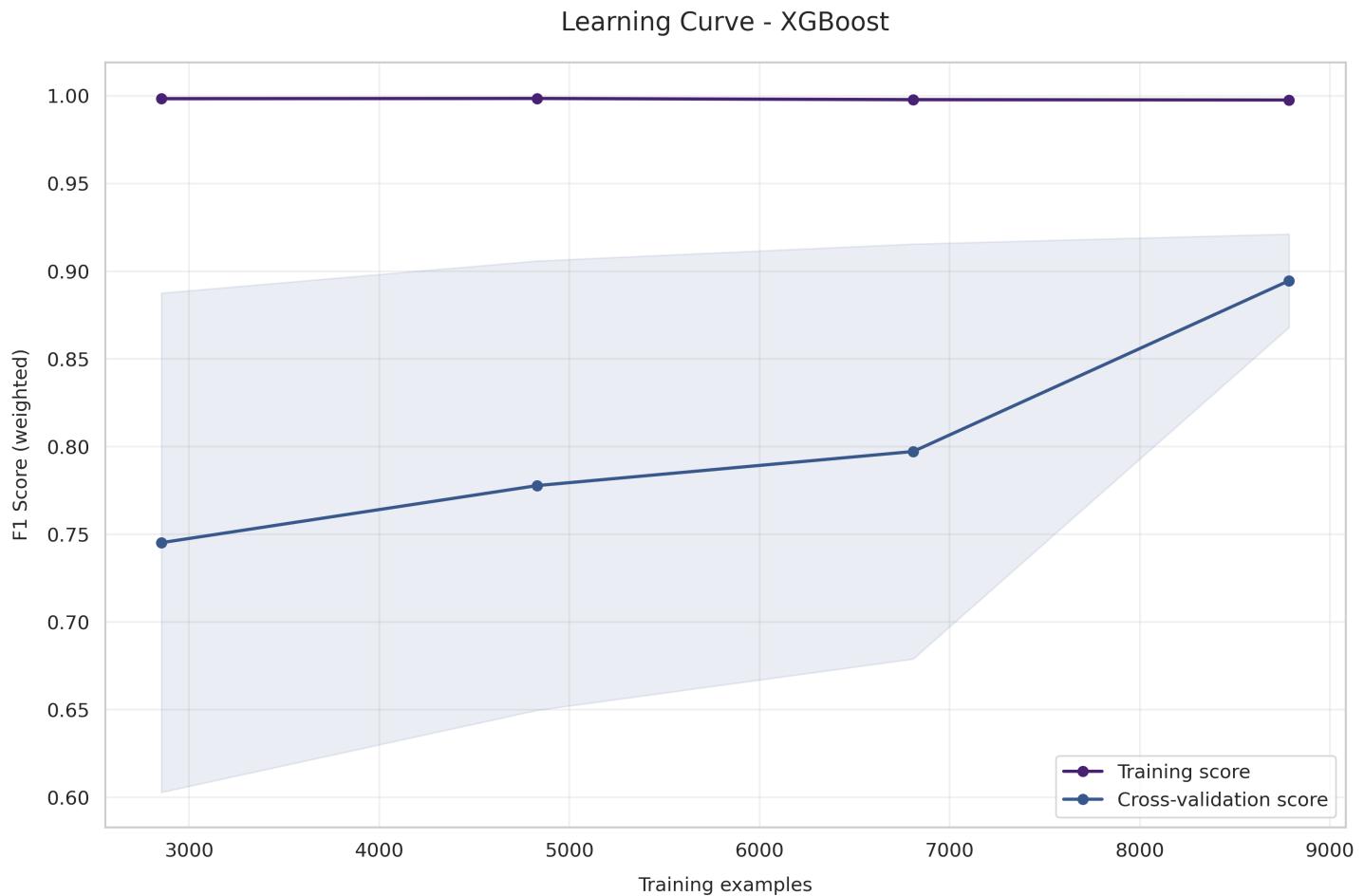


Machine Learning Analysis for Syscalls Classification

Confusion Matrix - XGBoost



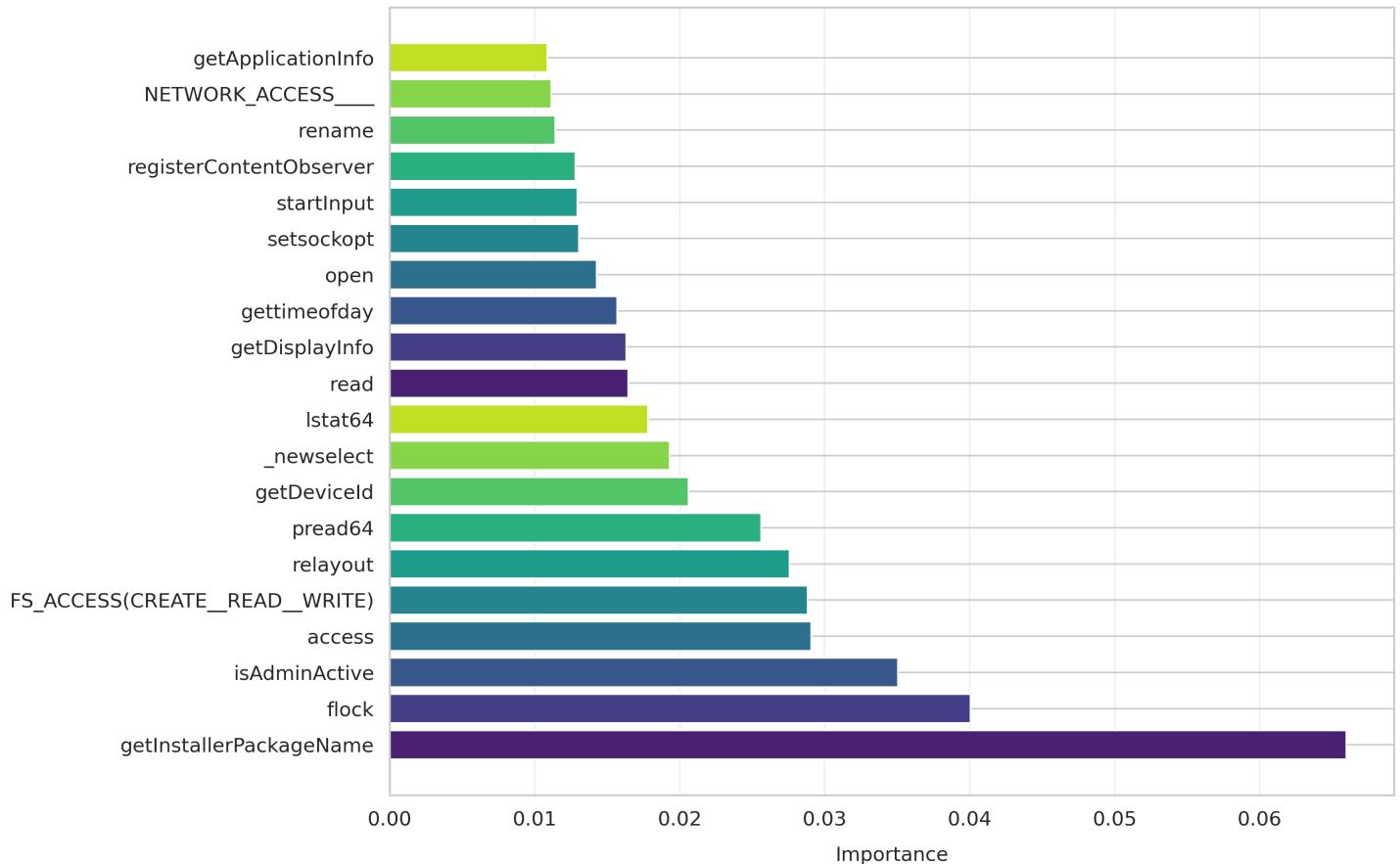
Learning Curve - XGBoost



Machine Learning Analysis for Syscalls Classification

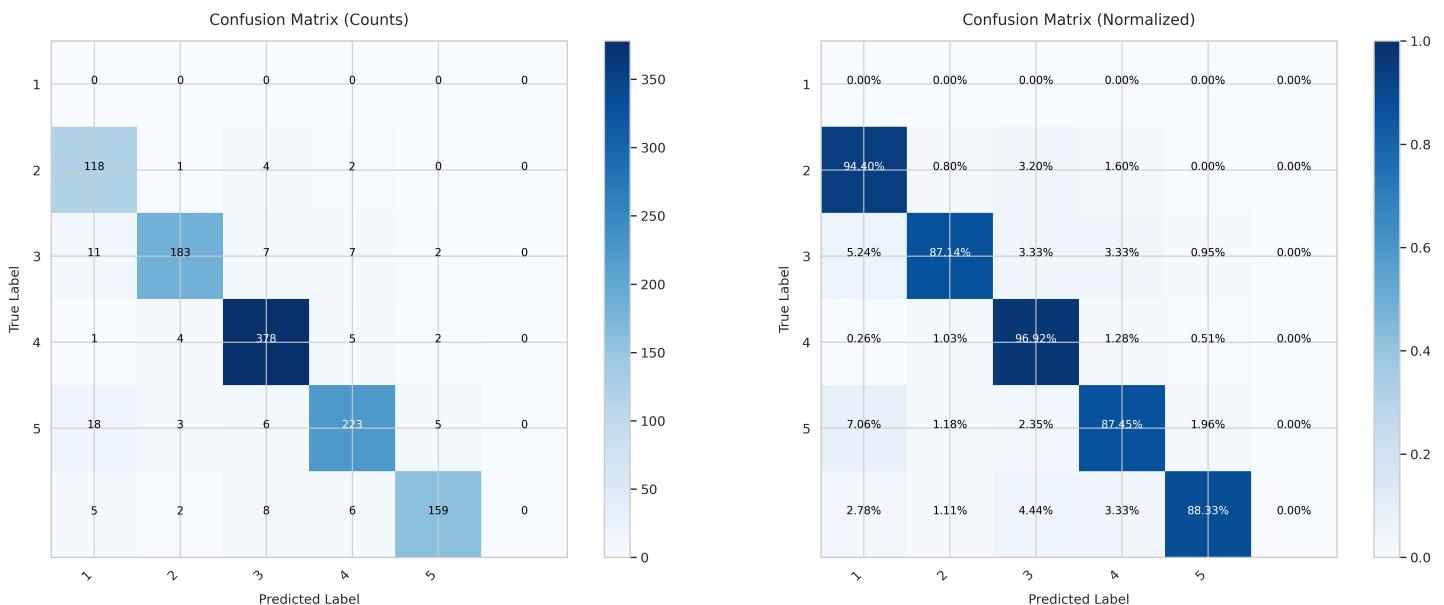
Feature Importance - XGBoost

Feature Importance - XGBoost



Confusion Matrix - RandomForest

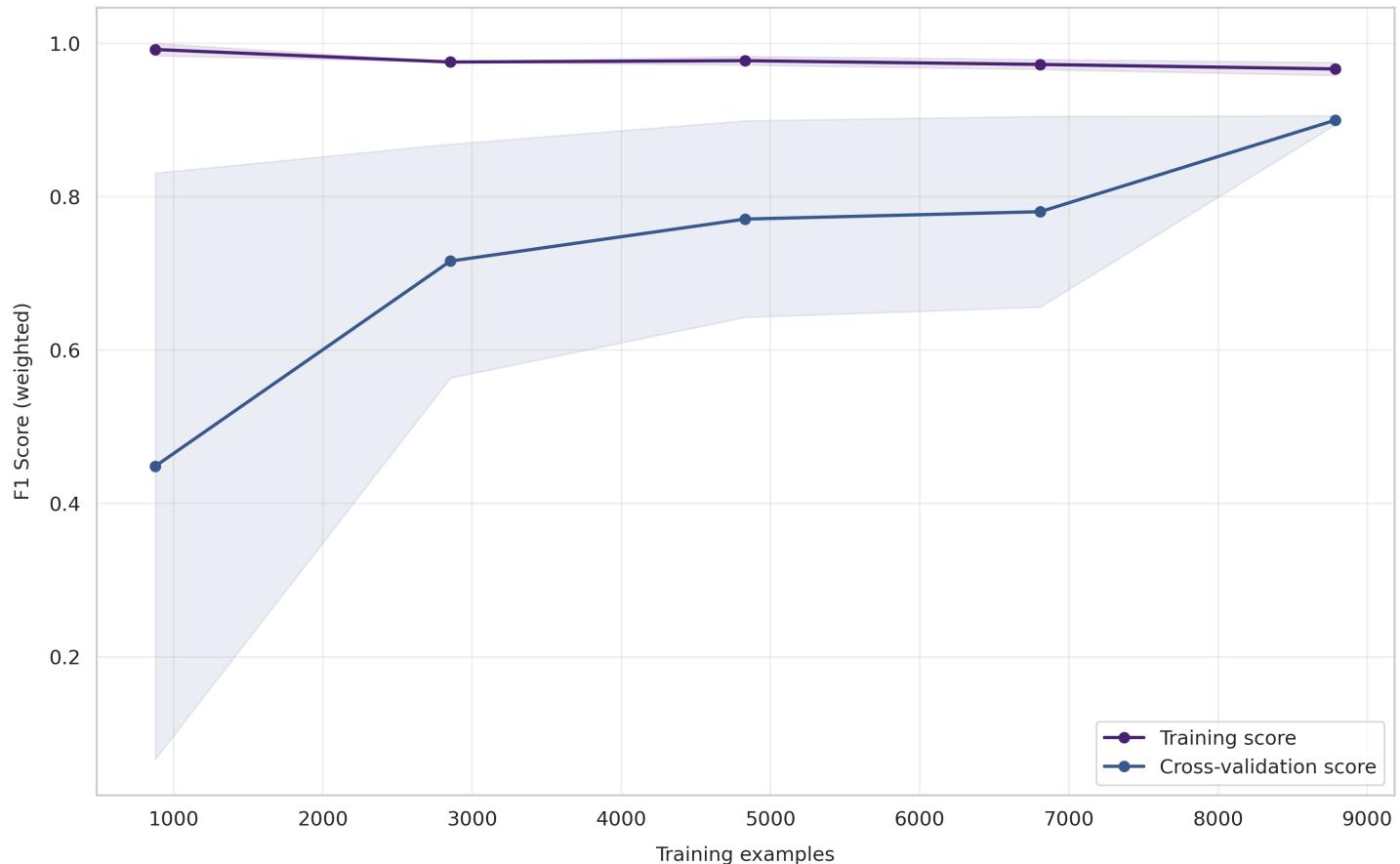
Confusion Matrix - RandomForest



Machine Learning Analysis for Syscalls Classification

Learning Curve - RandomForest

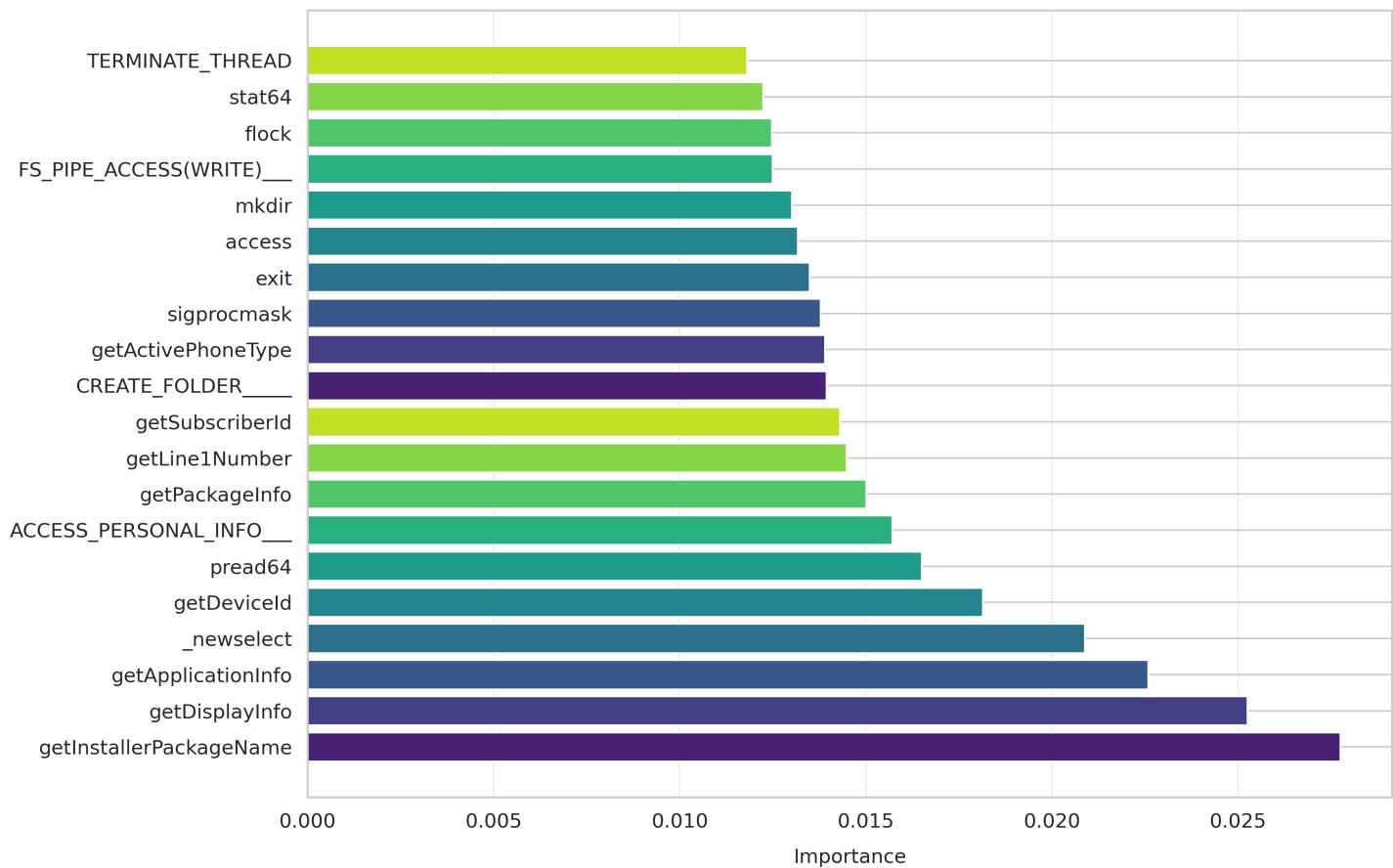
Learning Curve - RandomForest



Feature Importance - RandomForest

Machine Learning Analysis for Syscalls Classification

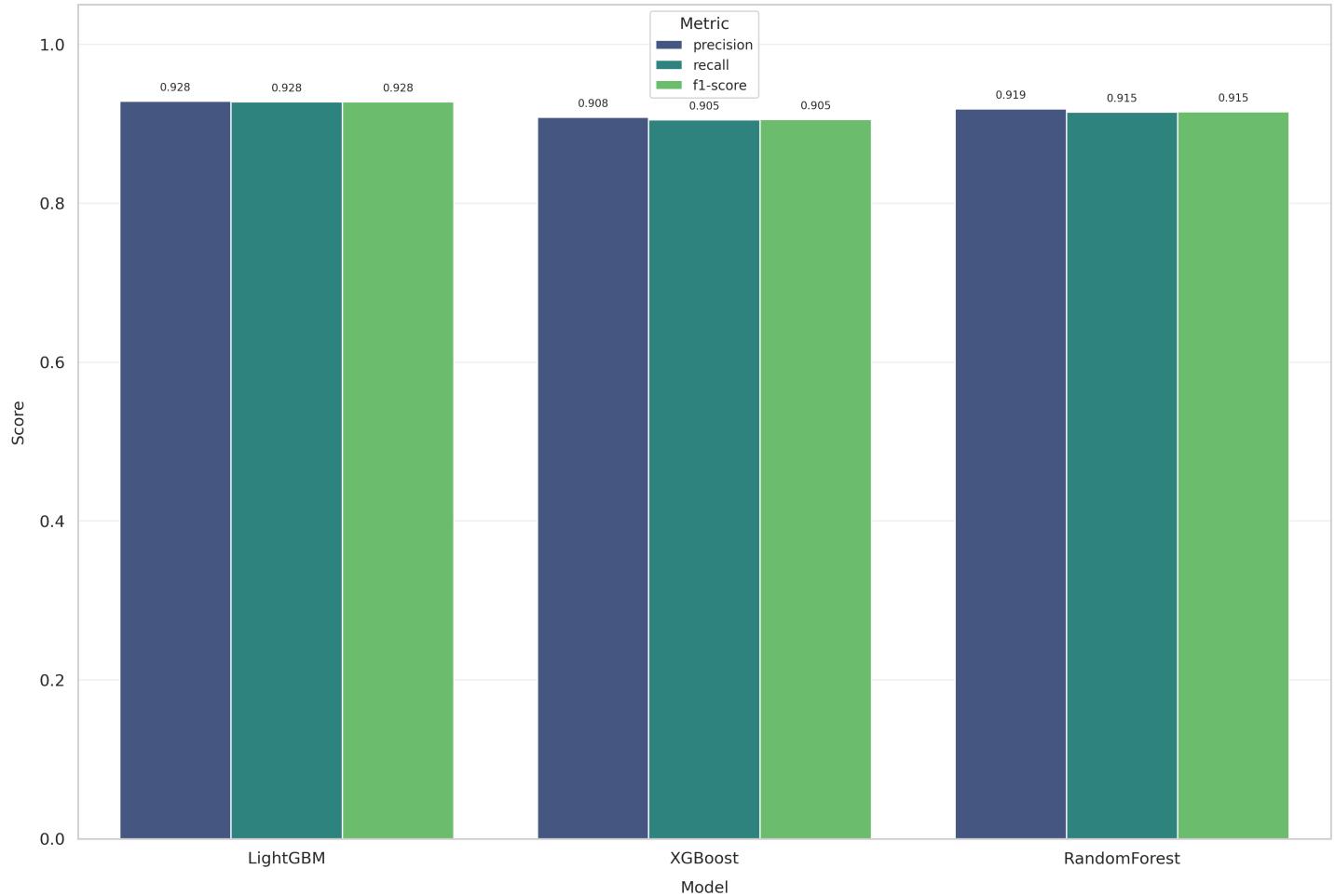
Feature Importance - RandomForest



Machine Learning Analysis for Syscalls Classification

Model Performance Comparison

Model Performance Comparison (Weighted Metrics)



Machine Learning Analysis for Syscalls Classification

Model Performance Summary

Model	Accuracy	F1 Score	Precision
LightGBM	0.9276	0.9276	0.9285
XGBoost	0.9052	0.9054	0.9083
RandomForest	0.9147	0.9151	0.9187

Best Model: LightGBM

Parameters: {'n_estimators': 100, 'max_depth': 3, 'learning_rate': 0.1}