Salifort Motors Employee Retention Model

Insights

OVERVIEW

The HR analytics team at Salifort Motors developed and evaluated multiple classification models to predict employee turnover and identify key factors influencing retention. After testing both Random Forest and XGBoost, the Random Forest Classifier was selected as the final model due to its superior precision, recall, and interpretability. The model helps HR proactively identify employees at risk of leaving, enabling data-driven retention strategies focused on satisfaction, workload, and work-life balance.

PROJECT STATUS

Model Completed & Evaluated

- Two models tested: Random Forest and XGBoost.
- Random Forest chosen for its balance of accuracy, recall, and interpretability.
- Achieved Precision: 0.99, Recall: 0.92, F1-score: 0.95, and Accuracy: 0.98 on test data.
- GridSearchCV used for hyperparameter tuning with cross-validation (216 Random Forest candidates, 72 XGBoost candidates).
- Confusion matrices confirmed strong performance with minimal false negatives.
- Top predictive features identified through feature importance ranking.

NEXT STEPS

- Targeted Retention Actions: HR should monitor and improve employee satisfaction and workload balance, especially in high-turnover departments.
- Continuous Monitoring: Retrain the model periodically to adapt to new HR data and evolving workforce trends.
- Integrate with HR Systems: Deploy model outputs in HR dashboards for proactive employee retention tracking.
- Feature Optimization: Re-train model focusing on top 5 predictive features to further enhance accuracy and interpretability.
- Policy Feedback Loop: Use model insights to design initiatives that improve satisfaction, recognition, and promotion opportunities.

KEY INSIGHTS

- Top Predictors: Satisfaction level, last evaluation, number of projects, average monthly hours, and tenure were the most influential features in predicting employee turnover.
- Workload Impact: Employees working longer hours or managing more projects were more likely to leave.
- Satisfaction Correlation: Low satisfaction strongly correlated with higher attrition rates.
- Department Trends: Sales, Support, and Technical departments had the highest turnover rates.
- Ethical Considerations: No sensitive data used; fairness maintained by focusing on job-related factors only.