

Predictive Modeling for Policy Lapse Forecasting Using Machine Learning

Dissertation Presentation

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Project Overview

Policy: A contract between an insurer and the insured, where the insurer agrees to compensate the insured for specific losses in exchange for premium payments.

Policy Lapse: An insurance policy lapse occurs when a policyholder fails to pay the premium within the grace period, leading to the termination of the policy.

Traditional management approaches are reactive, addressing lapses after they occur. This project aims to shift towards proactive management using predictive modeling.



Project Objectives

- Develop a predictive model for policy lapses using machine learning.
- Identify key predictors that influence policy lapses.
- Validate the predictive model with historical data.
- Assess practical implications for policymakers and provide recommendations.



Literature Review

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Current Practices and Challenges:

- Manual and semi-automated processes dominate policy lifecycle management.
- Difficulty in accurately predicting policyholder behavior and adapting to rapidly changing market conditions and customer preferences.

Importance:

- Increases prediction accuracy and efficiency.
- Supports proactive customer retention.
- Enables personalized policy offerings and pricing.



Methodology



Data Collection and Preprocessing

Gather relevant data from diverse sources. Clean, Normalize and Engineer Data



Model Development and Validation

Feature Selection, Model Development and Validation

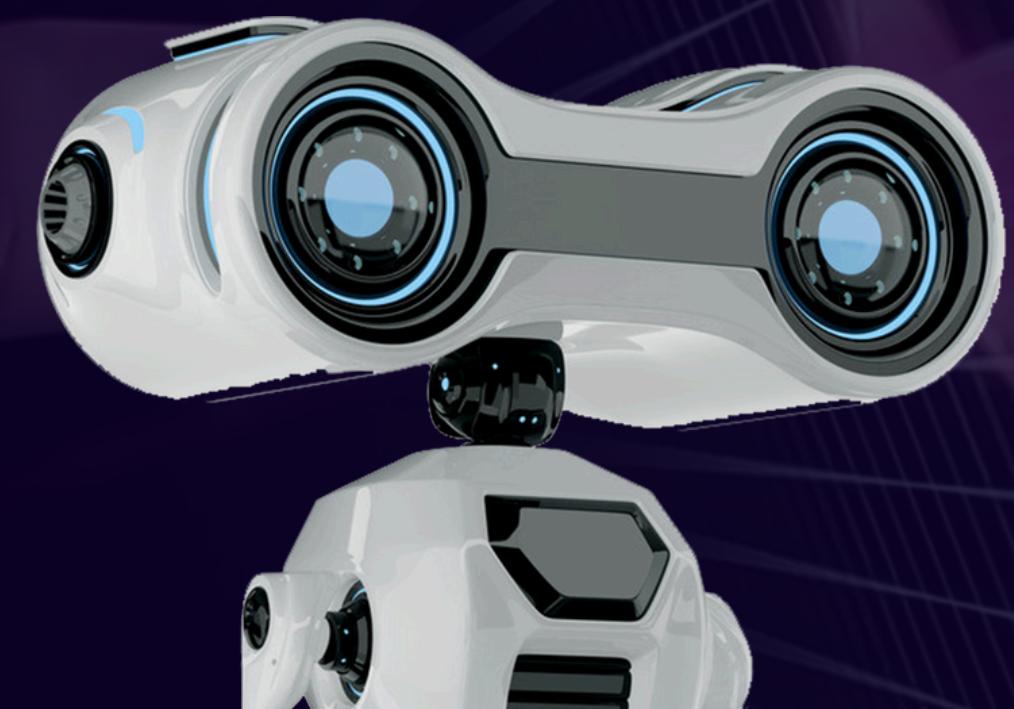


Analysis of Key Predictors

Identify and analyze important predictors

Data Collection and Preprocessing

Gather relevant datasets from various sources and clean, normalize, and preprocess the data to ensure its quality and consistency. This step is crucial for training accurate and reliable AI models.

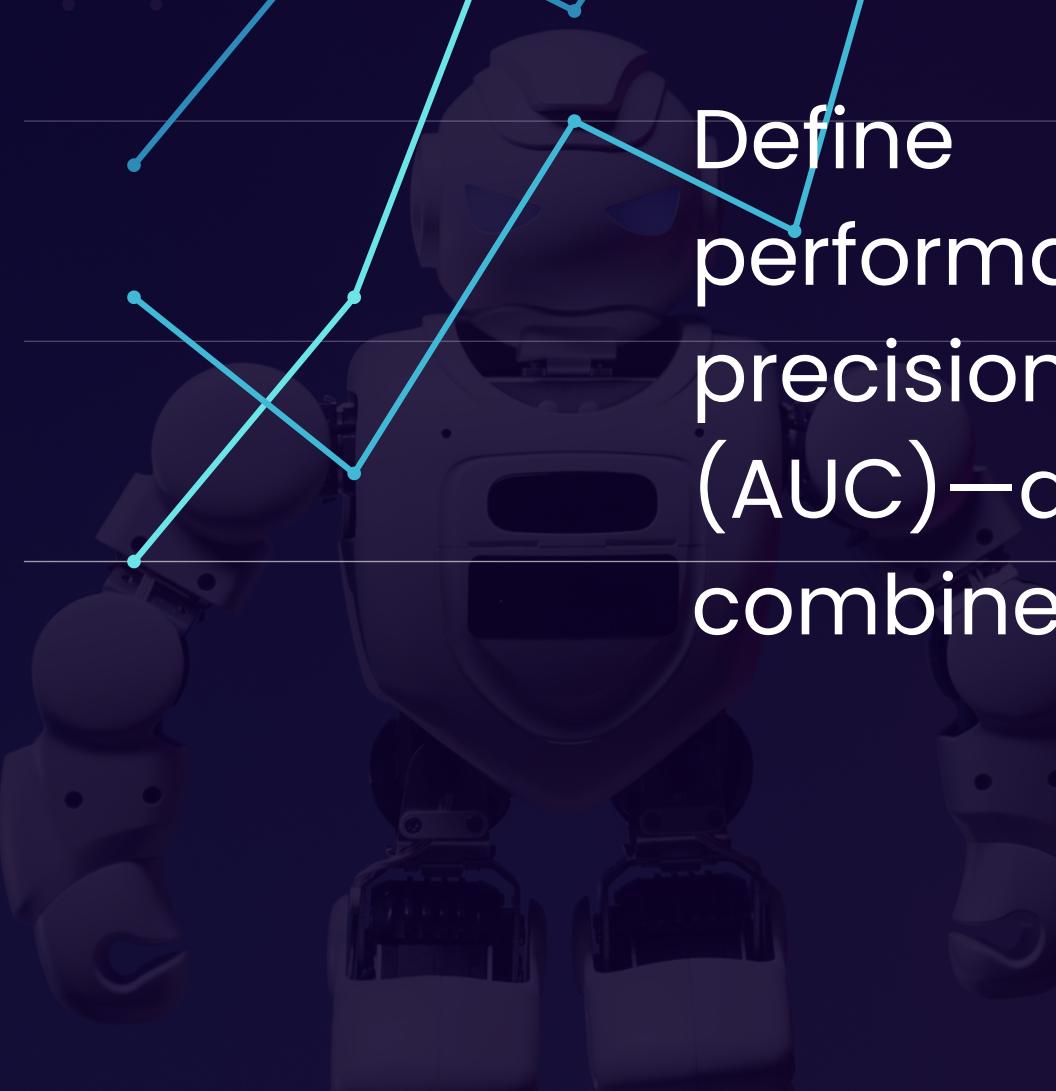


Model Development

- Design and implement machine learning and deep learning models. This involves experimenting with different architectures, hyperparameters, and optimization techniques. Training and testing sets split for validation.
- Validation Results: Performance metrics and comparison of different models.



Evaluation Metrics and Key Predictors Analysis



Define appropriate metrics to assess the performance of the models, such as accuracy, precision, recall, F1 score, and area under the curve (AUC)—analysis of the effects of individual and combined predictors on policy lapses.

Result and Impact

Present the results of the project, showcasing improvements in performance, efficiency, and decision-making compared to traditional methods. Also discuss the potential impact of our solutions on stakeholders and end-users.



Recommendations and Future Directions

- **Strategies for Reducing Policy Lapses:** Strategies based on model insights.
- **Best Practices:** Best practices for policymakers to follow.
- **Refinement of Predictive Models:** Areas for refining predictive models.



Thank You!