

Research Proposal: Improving SHAP Scalability in Credit Scoring

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Introduction

1

AI in Credit Scoring

Improved accuracy but "black box" models.

2

Explainable AI (XAI)

Essential for ensuring understandable and trustworthy credit-scoring decisions.

3

SHAP

Provides detailed, global and instance level explanations

Problem Statement

1. Scalability

2. Time Complexity

3. Lack of Quantitative Data

Research Questions, Hypotheses, and Objectives

Research Questions

1. How does the scalability of SHAP degrade as the volume of prediction instances increases in a tree-based ensemble machine learning model?
2. How can feature selection methods, the optimized version of SHAP (TreeSHAP), or both improve SHAP's scalability?

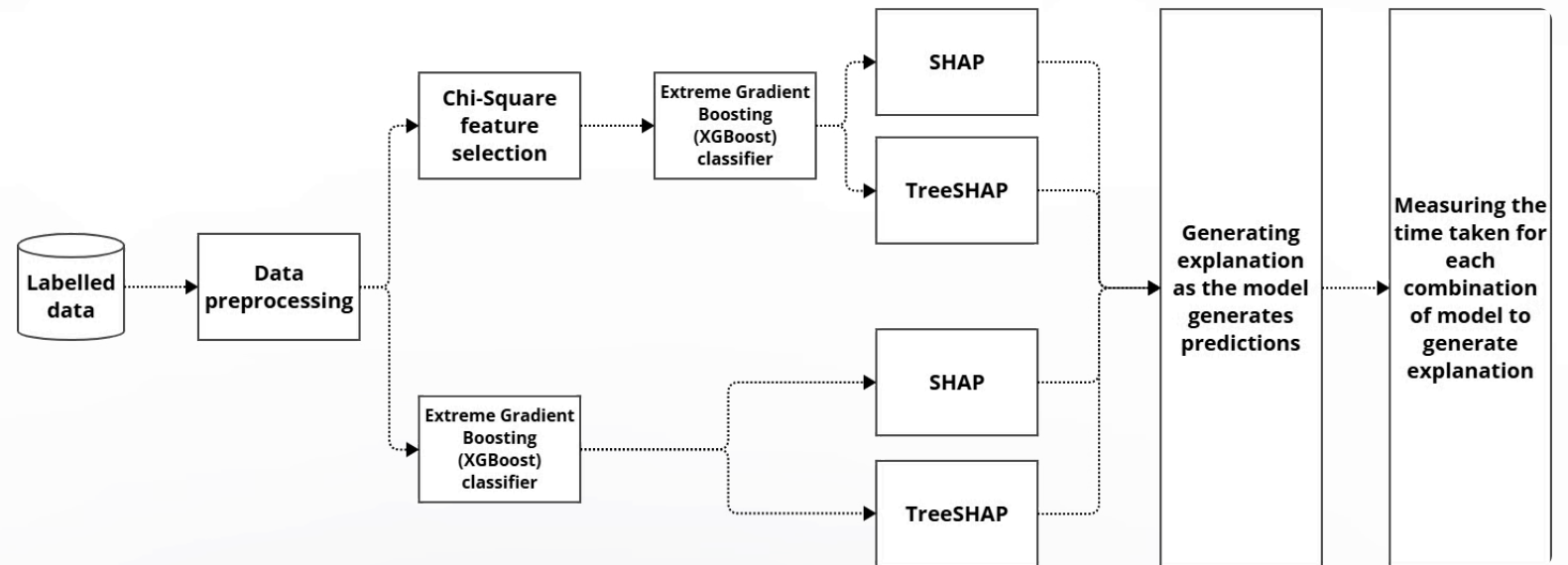
Hypotheses

SHAP's scalability degrades exponentially as the data volume increases, but using feature selection or TreeSHAP will significantly enhance its scalability.

Objectives

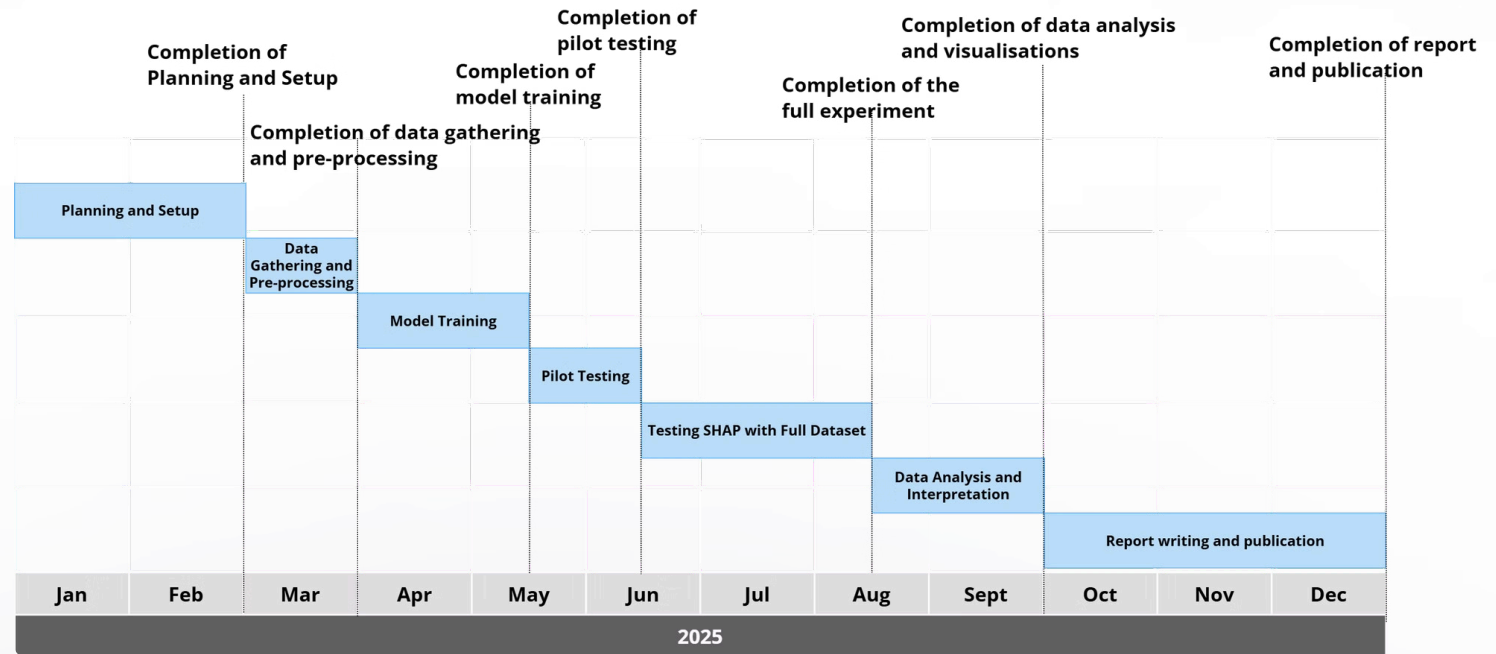
1. Quantify SHAP's degradation.
2. Explore how feature selection and TreeSHAP can improve its efficiency.

Research Methodology



TreeSHAP: Muschalik et al. (2024)

Timeline and Milestones



Expected Results and Impact

1

Filling in research gap

2

Identifying effective strategies to improve scalability

3

Offering solid, quantified data for future research

Significance and Contribution

1 Moving research on scalable XAI forward

2 Lowering operational costs of XAI

Thank you