

# Explaining Predictions with Shapley Values—An Introduction to the fastshap Package

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**Abstract** An abstract of less than 150 words.

## Introduction

Introductory section which may include references in parentheses (R Core Team, 2012), or cite a reference such as R Core Team (2012) in the text.

## Background

This section may contain a figure such as Figure 1.



**Figure 1:** The logo of fastshap.

## Estimating Shapley values in practice

TBD.

1. For  $i = 1, 2, \dots, j$ :
  - (a) Permute the values of feature  $X_i$  in the training data.
  - (b) Recompute the performance metric on the permuted data  $\mathcal{M}_{perm}$ .
  - (c) Record the difference from baseline using  $imp(X_i) = \mathcal{M}_{perm} - \mathcal{M}_{orig}$ .
2. Return the VI scores  $imp(X_1), imp(X_2), \dots, imp(X_j)$ .

**Algorithm 1:** Monte Carlo algorithm for approximating Shapley values.

## Special cases

TBD.

**Linear models:** LinearSHAP TBD.

**Tree-based models: TreeSHAP** TBD.

### **Shapley values in R**

TBD.

### **Example: predicting sales prices**

TBD.

### **Example: default of credit card clients**

TBD.

### **Summary**

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### **Bibliography**

R Core Team. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria, 2012. URL <http://www.R-project.org/>. ISBN 3-900051-07-0. [p1]

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