**Table 1.** Comparison of Machine Learning Algorithms.

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| --- | --- | --- | --- |
| Algorithm | Description | Advantages | References |
| Random Forest | An ensemble method with multiple decision trees. | High accuracy, low variance, identifies important features, easy interpretability. | [12, 13] |
| XGBoost | Creates a set of models made up of decision trees. Each model is trained to reduce the errors of previous models. | Fast training, high performance, scalability, regularisation. | [14, 15] |
| Decision Tree | Provides simple decision structures by dividing the data with branching rules. | Easy to understand, does not require preprocessing, works with categorical or numerical data. | [16] |
| Linear Regression | Models the linear relationship between the dependent and independent variables. | Simple, fast, interpretable. | [17, 18] |
| Support Vector Regression | Tries to best capture the relationship between the dependent and independent variables within a certain margin of error. | High accuracy, low variance, scalability. | [19] |
| Lasso Regression | Models the relationship between the dependent and independent variables. Adds a regularisation term that minimises the sum of the absolute values of the coefficients. | Feature selection, prevents overfitting, interpretable. | [20, 21] |

**Table 2.** Performance Comparison of Machine Learning Algorithms Used in Estimating Tp-e Interval.

|  |  |  |  |
| --- | --- | --- | --- |
| **Algorithm** | **MAE** | **MSE** | **R- Squared** |
| Random Forest Regressor | 0.12 | 0.03 | 0.97 |
| XGBoost | 0.15 | 0.04 | 0.95 |
| Support Vector Regression | 0.18 | 0.06 | 0.92 |
| Decision Tree Regressor | 0.21 | 0.08 | 0.89 |
| Lasso Regression | 0.24 | 0.10 | 0.86 |
| Linear Regression | 0.27 | 0.12 | 0.83 |