ABSTRACT BOOK

19th Prof. Vladas Gronskas International Scientific Conference

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Kaunas, Lithuania

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POSTERS

MODEL FOR PREDICTING DOG STAY TIME AT "PENKTA KOJA" ANIMAL SHELTER

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The "Penkta Koja" dog shelter faces challenges with prolonged stays for some dogs awaiting adoption. This study aims to develop a machine learning model to predict a dog's shelter stay duration based on available attributes such as gender, age, size, color, and arrival/departure quarters. Utilizing the XGBoost regression algorithm, the model processes categorical variables through OneHotEncoding and standardized numerical features. With hyperparameter tuning via GridSearchCV, the best configuration achieved an average absolute error (MAE) of 59.96 days and an R^2 of 0.18, indicating low prediction accuracy and room for improvement. For example, the model predicted a 99.11-day stay for a medium-sized, 2-month-old black dog. While initial results provide insights, integrating additional features like temperament or health status could enhance accuracy, offering a practical tool for the shelter to optimize care and adoption efforts.

Key words: *dog shelter, machine learning, XGBoost regression, adoption prediction, data analysis*

POSTERS

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MODEL FOR PREDICTING DOG STAY TIME AT "PENKTA KOJA" ANIMAL SHELTER

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PROBLEM AND RELEVANCE

Problem: Long waiting times for dog adoption at shelters.
Relevance: Predicting waiting times can help optimize shelter resources and adoption rates.

AIM

Develop a predictive model to estimate a dog's stay duration.

NOVELTY OF PROPOSED SOLUTION

Use of machine learning (XGBoost regression) to predict shelter duration based on characteristics like age, size, and intake quarter.

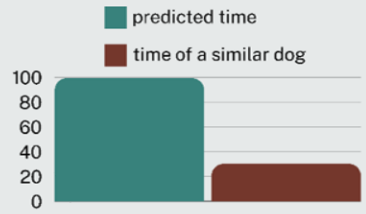
TASKS

- Collect and preprocess data.
- Optimize a machine learning model.
- Evaluate model accuracy and propose improvements.

KEY RESULTS

Performance Metrics:
Mean Absolute Error (MAE): 59.96 days.
R^2: 0.18.
Example Prediction: For a 2-month-old black medium-sized dog, who arrived in the first quarter, predicted stay duration is 99.11 days.

PREDICTED VS. ACTUAL TIME IN SHELTER



This chart compares the predicted shelter stay for a dog with the actual time spent by a similar dog.

RESEARCH METHODS

Model: XGBoost regression.
Data Preprocessing:
- Categorical encoding with OneHotEncoder.
- Standardization of numerical variables.
- Log transformation for target variable.

Hyperparameter Tuning: GridSearchCV with 54 combinations.

RECOMMENDATIONS

- Improve the model by incorporating additional data such as temperament and health condition.
- Increase dataset size for more robust predictions.

References:
Data from "Penkta Koja" shelter.

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