

# **MKT 3434**

# **Machine Learning GUI**

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## **Features Of The GUI:**

This report describes the enhancements made to the Machine Learning (ML) GUI application, including new functionalities such as multiple regression and classification models, dynamic loss function selection, missing data handling techniques, and visualization features.

The application supports a wide range of models, including:

- **Regression Models:**

- Linear Regression
- Ridge Regression
- Lasso Regression
- Huber Regression
- Support Vector Regression (SVR) with kernel selection (linear, RBF, polynomial) and hyperparameters (C, epsilon)

- **Classification Models:**

- Logistic Regression
- Support Vector Classification (SVC)
- Gaussian Naïve Bayes (with configurable var\_smoothing and custom prior probabilities)

- **Regression Loss Functions:**

- Mean Squared Error (MSE)
- Mean Absolute Error (MAE)
- Huber Loss

- **Classification Loss Functions:**

- Cross-Entropy Loss
- Hinge Loss

- **Handling Missing Data**

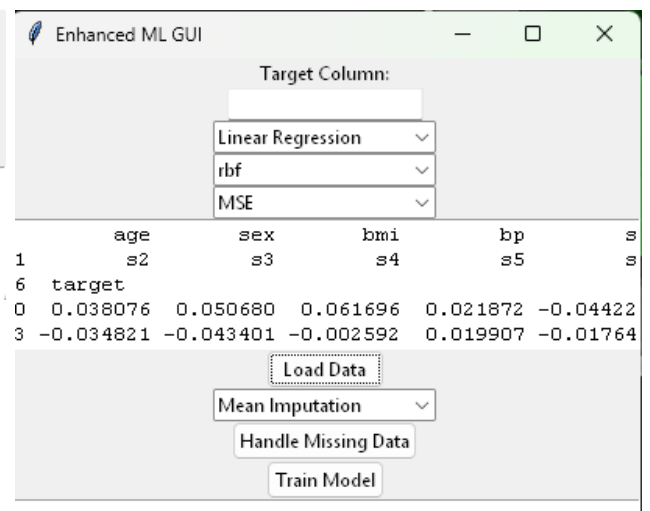
- Mean Imputation (replacing missing values with column means)
- Interpolation (filling missing values based on data trends)
- Forward Fill (propagating previous values forward)
- Backward Fill (propagating subsequent values backward)

- **Visualization**

According the Base GUI that we have a dataset in the begginning. We got the dataset of the GUI and seperated it as boston\_housing\_dataset.csv file. With the new GUI, we can do more analysis on this dataset and more. There are some shots of the GUI:



*Before The Dataset Loading*



*After The Dataset Loading*

Enhanced ML GUI

Target Column:

age

Linear Regression

rbf

MSE

	age	sex	bmi	bp	s
1	s2	s3	s4	s5	s
6	target				
0	0.038076	0.050680	0.061696	0.021872	-0.04422
3	-0.034821	-0.043401	-0.002592	0.019907	-0.01764

Load Data

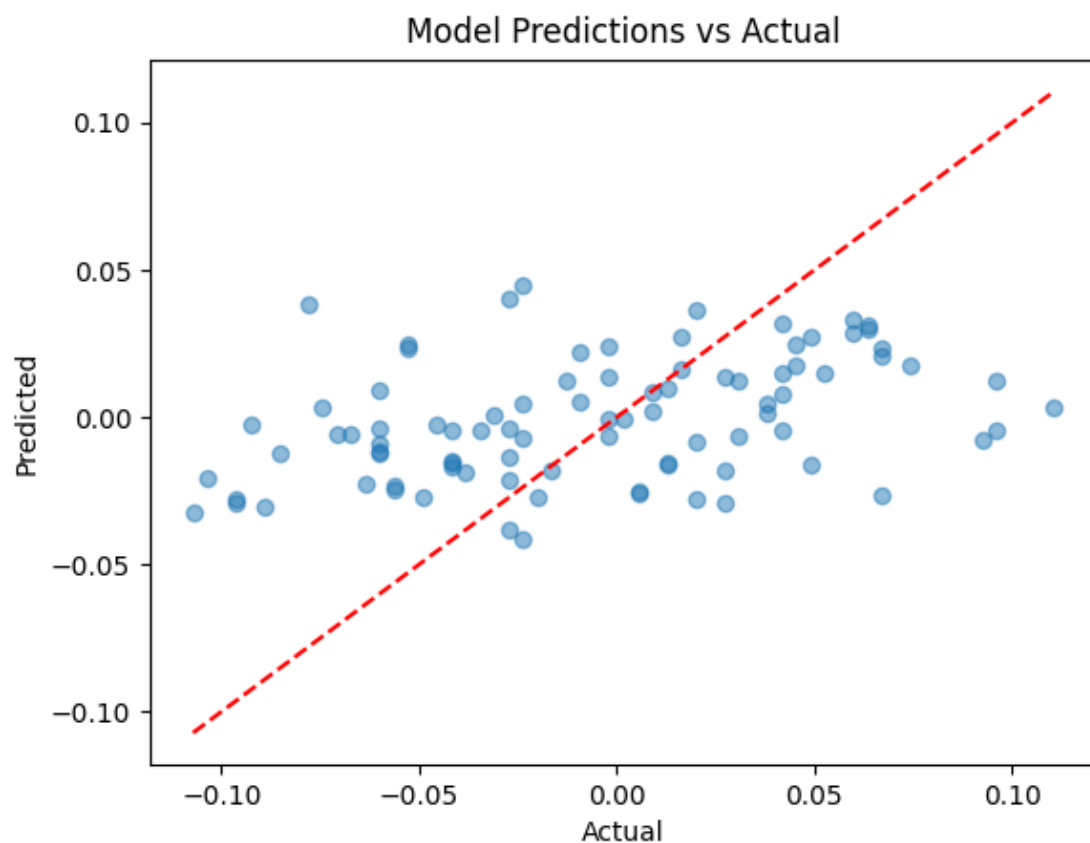
Interpolation

Handle Missing Data

Train Model

Model: Linear Regression

Loss (MSE): 0.0023160854008062314



A Basic Linear Regression Analyse Of The Dataset