

# Eye Blinking Regression Report

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## 1 Introduction

This report presents the results of the eye blinking regression task using CNNs trained on RGB eye data from the MRL eyes dataset. The goal is to predict the degree of eye openness on a scale of 0 to 1.

## 2 Dataset

The MRL eyes dataset consists of over 80,000 images of eyes, divided into 37 subfolders representing different eye types. The images were preprocessed by resizing them to  $64 \times 64$  pixels and converting them to RGB format. The dataset was split into training, validation, and testing sets.

## 3 Model Architecture

The CNN model used for this task has the following architecture:

- Convolutional layer with 64 filters of size `filter_size` $\times$ 3 and ReLU activation
- MaxPooling layer with pool size (2, 2)
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- MaxPooling layer with pool size (2, 2)
- Flatten layer
- Dense layer with 128 units and ReLU activation
- Output layer with 1 unit and sigmoid activation

The model was compiled with the `{best_params['optimizer']}` optimizer and mean squared error loss. The best hyperparameters found during grid search were: `'batch_size': 32, 'epochs': 10, 'filter_size': 3, 'num_filters': 64, 'optimizer': <keras.optimizers.legacy.adam.Adam object at 0x7f9a19185030>`

## 4 Results

The model was trained and evaluated on the validation and test sets. The evaluation metric used was mean absolute error (MAE).

### 4.1 Validation Set Results

The MAE on the validation set was 0.087.

### 4.2 Test Set Results

The MAE on the test set was 0.077.

## 5 Conclusion

The eye blinking regression model achieved promising results with low MAE values on both the validation and test sets. Further analysis and fine-tuning can be performed to improve the model's performance.