

CELEBRITIES RECOGNITION MODEL REPORT

SELECTED MODEL: **Convolutional Neural Network (CNN)**

ARCHITECTURE:

- Input Layer: Supports pictures with sizes of 128, 128, and 3.
- Convolutional Layer: Utilises a (3, 3) kernel with ReLU activation to incorporate 32 filters.
- Max Pooling Layer: Reduces the amount of space needed to extract features.
- Flatten Layer: Provides a vector representation of the 2D matrix data for additional processing.
- Dense Layers: ReLU activation is present in both fully connected layers, one of which has a 0.1 regularisation dropout. Softmax activation is used in the last layer for multi-class

COMPILATION:

- Optimizer: During training, the model's weights are modified using the Adam optimizer.
- Loss Function: For integer labels in multi-class classification tasks, this function uses sparse categorical crossentropy.

TRAINING PROCEDURE:

Data Loading and Preprocessing: From a designated directory, images are read and preprocessed to create a dataset with matching labels. The photos undergo resizing to 128, 128 pixel dimensions, along with pixel value normalisation.

Data Splitting:

The dataset is partitioned into training and testing sets, with a distribution of 70% for training and 30% for testing.

Model Training:

20 epochs are used to train the model, with a batch size of 128 for each iteration. The model's performance is tracked during training using a 10% validation split.

Visualizations:

Plotting and saving of accuracy and loss across epochs is done for both the training and validation sets. The model's learning trajectory can be examined using these visualisations to spot possible overfitting situations.

CRITICAL FINDINGS:

Accuracy and Loss Plots:

The training and validation datasets incremental improvement over epochs is graphically depicted by the accuracy plot. The loss plot gives important information about how well the model generalises to new data by showing how it converges during training.

Model Evaluation:

A separate test set is used to evaluate the trained model. The model's performance is quantified by calculating and printing the accuracy of the model on the test data.

Example Predictions:

The model's proficiency in predicting celebrities from specific images is showcased. Sample predictions are made on images of Lionel Messi, Roger Federer, Virat Kohli, Maria Sharapova, and Serena Williams. A qualitative assessment of the model's performance on real-world data is provided.

Note: Some predictions may be incorrect due to the presence of misleading images in certain folders within the training set

CONCLUSION

The selected CNN model shows promise for identifying celebrities. Important discoveries, like loss and accuracy graphs, offer insightful information about the learning dynamics of the model. Its real-world performance can be understood from key perspectives provided by the test set evaluation and sample predictions. Given these noteworthy discoveries, there exists opportunities for additional optimisation and improvement to augment the precision and resilience of the model.