Deep Learning Model Training Report

**Introduction**

In this report, we present the results of training a deep neural network (DNN) model for binary classification using the provided dataset which I collect from kaggle here is link “https://www.kaggle.com/datasets/ashwingupta3012/human-faces” . The goal of the project was to build a DNN that can accurately classify instances into two classes gender wise male and female.

**Dataset Description**

The dataset contain 7.2k+ images of male and female .The dataset consists of normalized features and corresponding binary labels. The features were preprocessed and normalized using Min-Max scaling. The dataset was split into training and testing sets using a 80-20 split ratio.

**Model Architecture**

The deep neural network architecture consisted of three layers: two hidden layers with Rectified Linear Unit (ReLU) activation functions and one output layer with a sigmoid activation function. The model was compiled using the Adam optimizer and binary cross-entropy loss.

The model training process was executed over 10 epochs, with a batch size of 32 instances per batch.

**Training Results**

The model's training progress is outlined below:

Epoch 1/10:

Training Time: 304 seconds

Loss: 1.0248

Accuracy: 60.37%

Validation Loss: 0.5987

Validation Accuracy: 68.49%

Epoch 2/10:

Training Time: 24 seconds

Loss: 0.8667

Accuracy: 63.38%

Validation Loss: 0.9551

Validation Accuracy: 64.66%

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Epoch 10/10:

Training Time: 25 seconds

Loss: 0.4437

Accuracy: 79.18%

Validation Loss: 0.4619

Validation Accuracy: 77.08%

**Model Evaluation**

After training, the model was evaluated using the testing dataset, and the following metrics were obtained:

Model Training Time: 733.5201172828674 seconds

Accuracy: 79.55%

**Conclusion**

The results show that the DNN model achieved a significant improvement in accuracy after training. The model exhibited a steady increase in accuracy and decrease in loss over the course of training epochs.

The achieved accuracy of approximately 79.55% on the testing dataset indicates that the model has learned meaningful features from the data and can generalize well to new instances. However, further experimentation could be performed to optimize the model's architecture, hyperparameters, and data preprocessing techniques for potentially improved results.

Overall, the successful training of this DNN model provides a foundation for further exploration and application in real-world binary classification tasks.