



AL2002 – Artificial Intelligence Lab

Lab Task # 12

Note:

- Plagiarism will not be **tolerated!!**
- Use comments wherever applicable.
- Please ensure to submit both a PDF document and a Python file containing your code on the classroom platform.

Problem: 1 - Implementing Convolutional Neural Network (CNN) for Gender Classification

Convolutional Neural Networks (CNNs):

CNNs are a class of deep neural networks primarily designed to process and analyze visual data by automatically learning hierarchical patterns through convolutional layers, enabling them to excel in tasks like image recognition and classification.

Performing Convolutional Neural Network (CNN) on Gender Dataset:

1. Perform Loading and Preprocessing on the Dataset:

- Perform the loading and preprocessing of the gender detection and classification image dataset for use in the CNN model. Perform any specific preprocessing steps necessary for this task. (link: <https://www.kaggle.com/datasets/trainingdatapro/gender-detection-and-classification-image-dataset>)

2. Implementing the CNN Architecture:

- Implement the CNN architecture for gender classification using suitable convolutional layers. Experiment with different convolutional layers and kernel sizes to optimize performance.

3. Adding Dense Layers for Classification:

- Add dense layers to the CNN model for the final classification task. Experiment with different activation functions and layer sizes to optimize performance.

4. Training and Evaluating the Model:

- Train the CNN model on the training dataset and evaluate its performance on the validation set. Monitor metrics such as accuracy and loss during training to assess model performance.

5. Calculating Training and Validation Accuracy:

- Calculate the training and validation accuracy of the CNN model based on its predictions. Discuss any observations or insights gained from these accuracy metrics.

6. Visualizing Loss and Accuracy:

- Visualize the loss and accuracy trends during training using suitable plots or graphs. Analyze these visualizations to identify patterns and potential areas for improvement in the model.

7. Summary and Conclusion:

- Summarize the results obtained from implementing the CNN model on the gender dataset. Reflect on the challenges faced, lessons learned, and potential future improvements for the model.