Deep Learning Project

أكاديمية سدايا
SDAIA Academy

Facial Emotion Recognition in Job interviews

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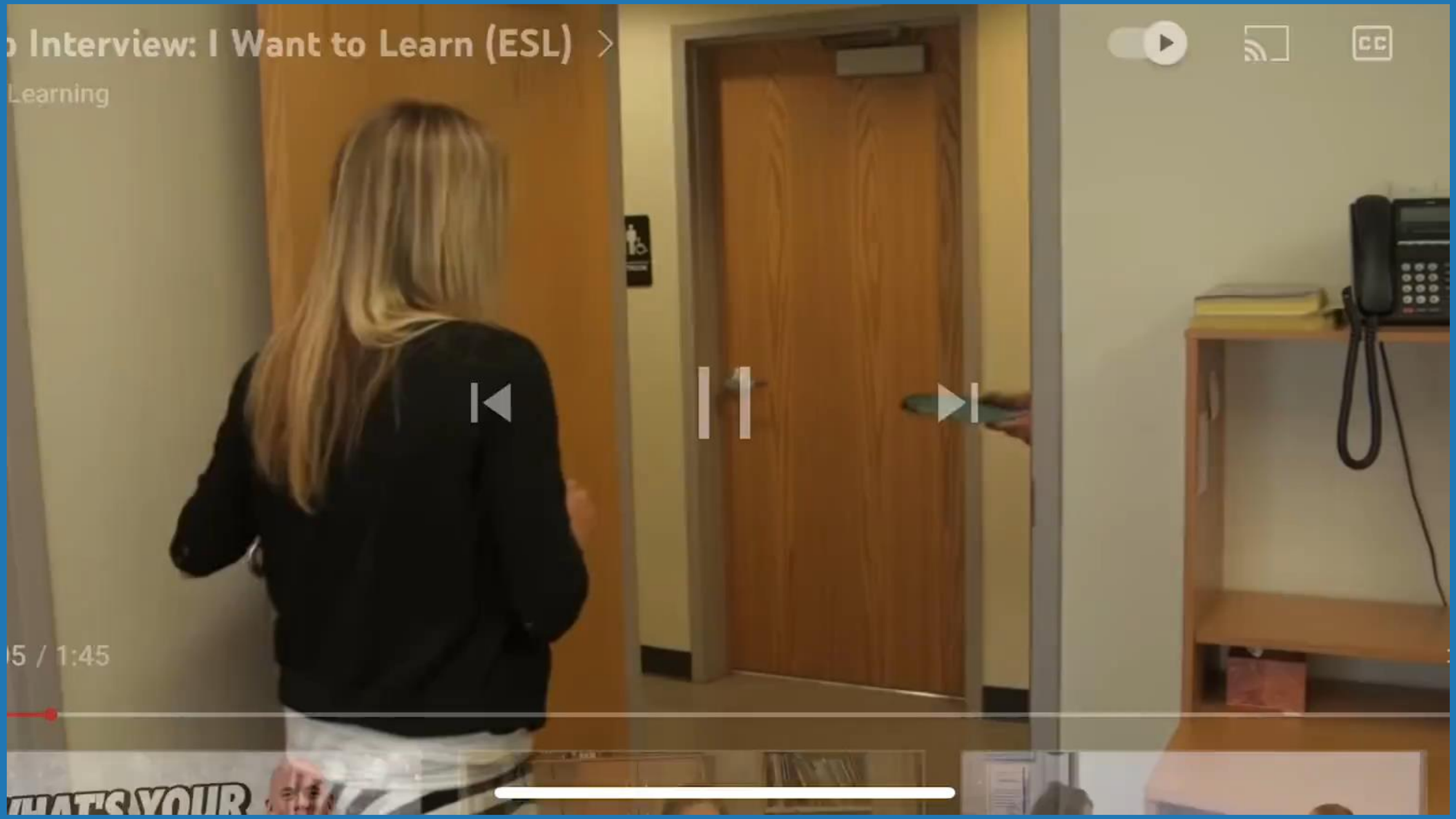
Interview: I Want to Learn (ESL)
Learning
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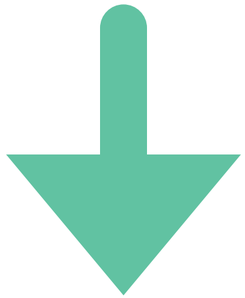
Introduction

Ministry of Human Resources and Social Development

وزارة الموارد البشرية
والتنمية الاجتماعية
المملكة العربية السعودية

- Using facial emotion recognition to prospective candidates based on some factors
- Finding the person whose personality and characteristics are best suited to the job



Building a Convolutional Neural Network model that uses the dataset images to determine the correct emotion type of a person face

Dataset

- Kaggle.com
- 32,298 of gray scale images
- divided into train and test dataset
- 28,709 images of train set
- 3,589 images of test set

Images are categorized based on the emotion shown in the facial expressions (happiness, neutral, sadness, anger, surprise, disgust, fear)

Exploratory Data Analysis

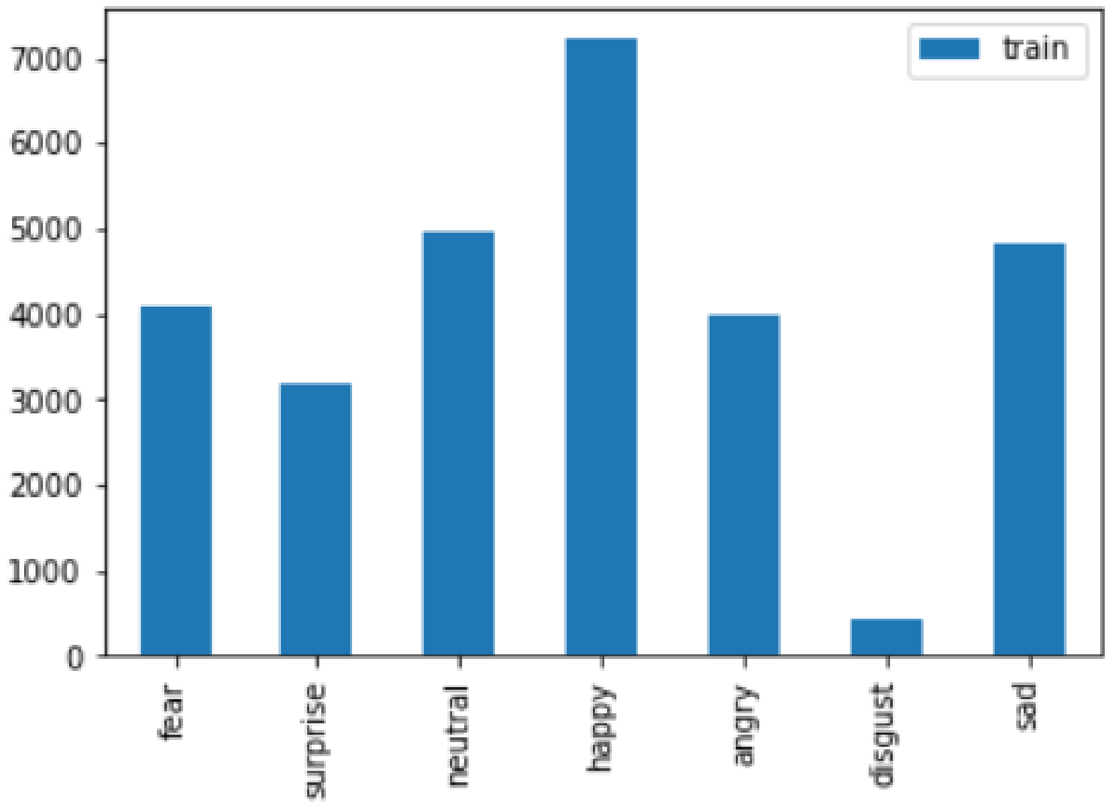


Fig 1: EDA for training set

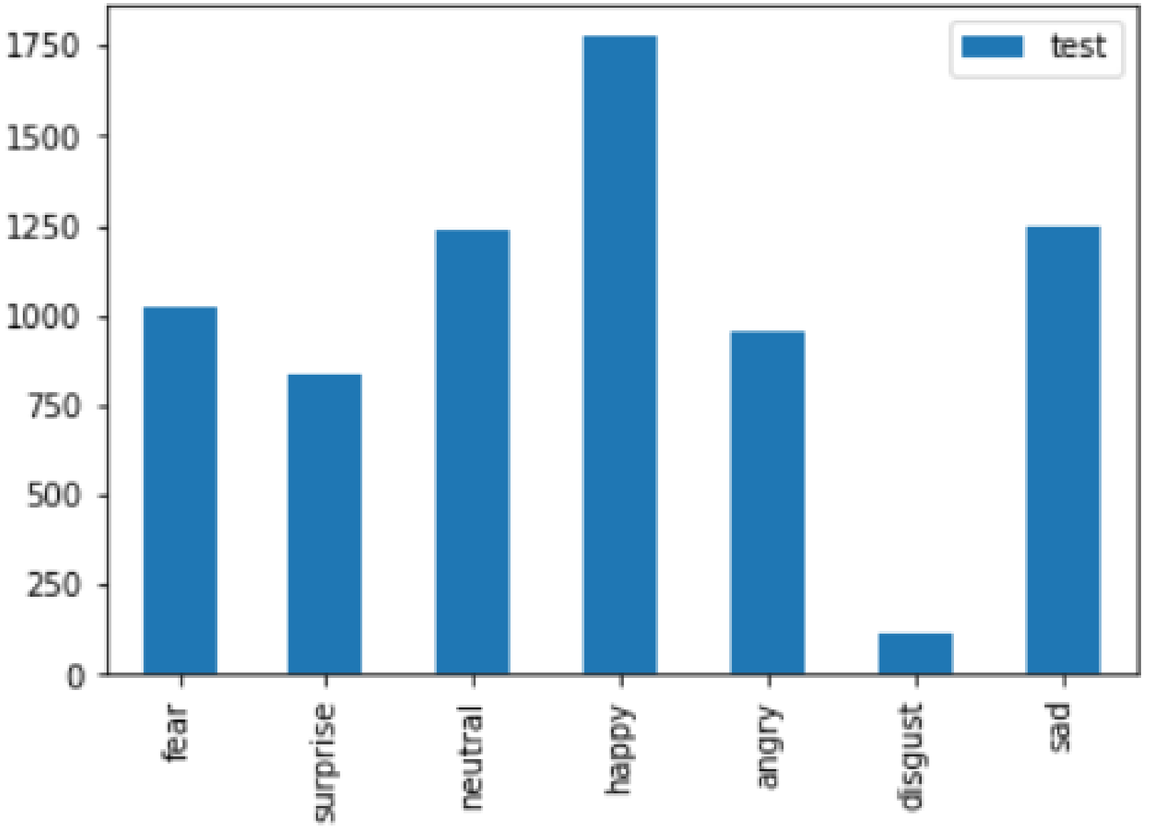
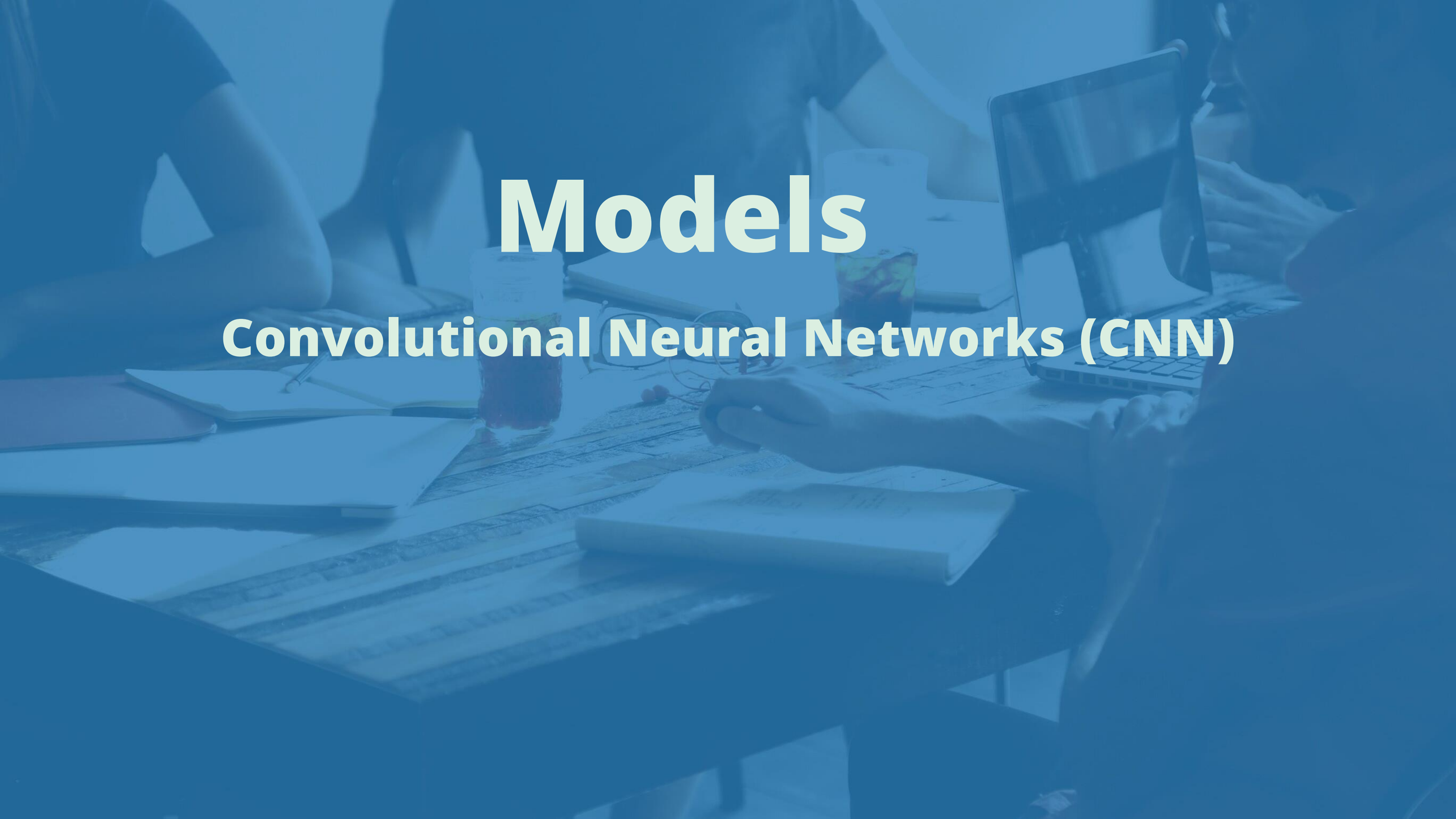


Fig 2: EDA for testing set



Models

Convolutional Neural Networks (CNN)

Model build settings:

Callbacks Function:

- 1.Model Check point.
- 2.Early Stopping.

Hyperparameter Settings:

- As shown in Table 1

Table 1: Hyperparameter Settings

(Hyper) Parameter	Setting
Epochs E	15
Batch Size	64
Activation Function	SoftMax
Optimizer	Adam Algorithm
Loss Function	Categorical cross entropy
Metrics	Accuracy

First Model Results:

By training the CNN model using 15 epochs, the accuracy results are constantly improving from 39 to 87

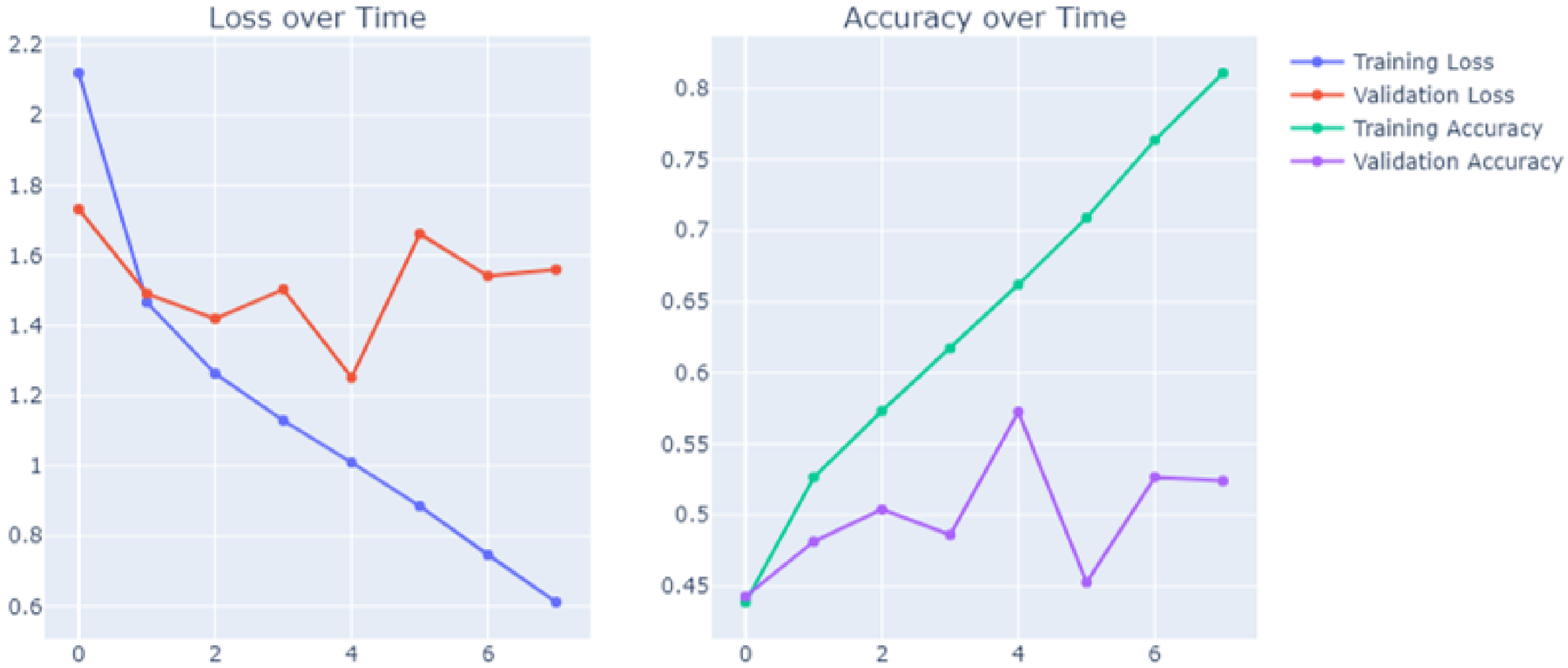
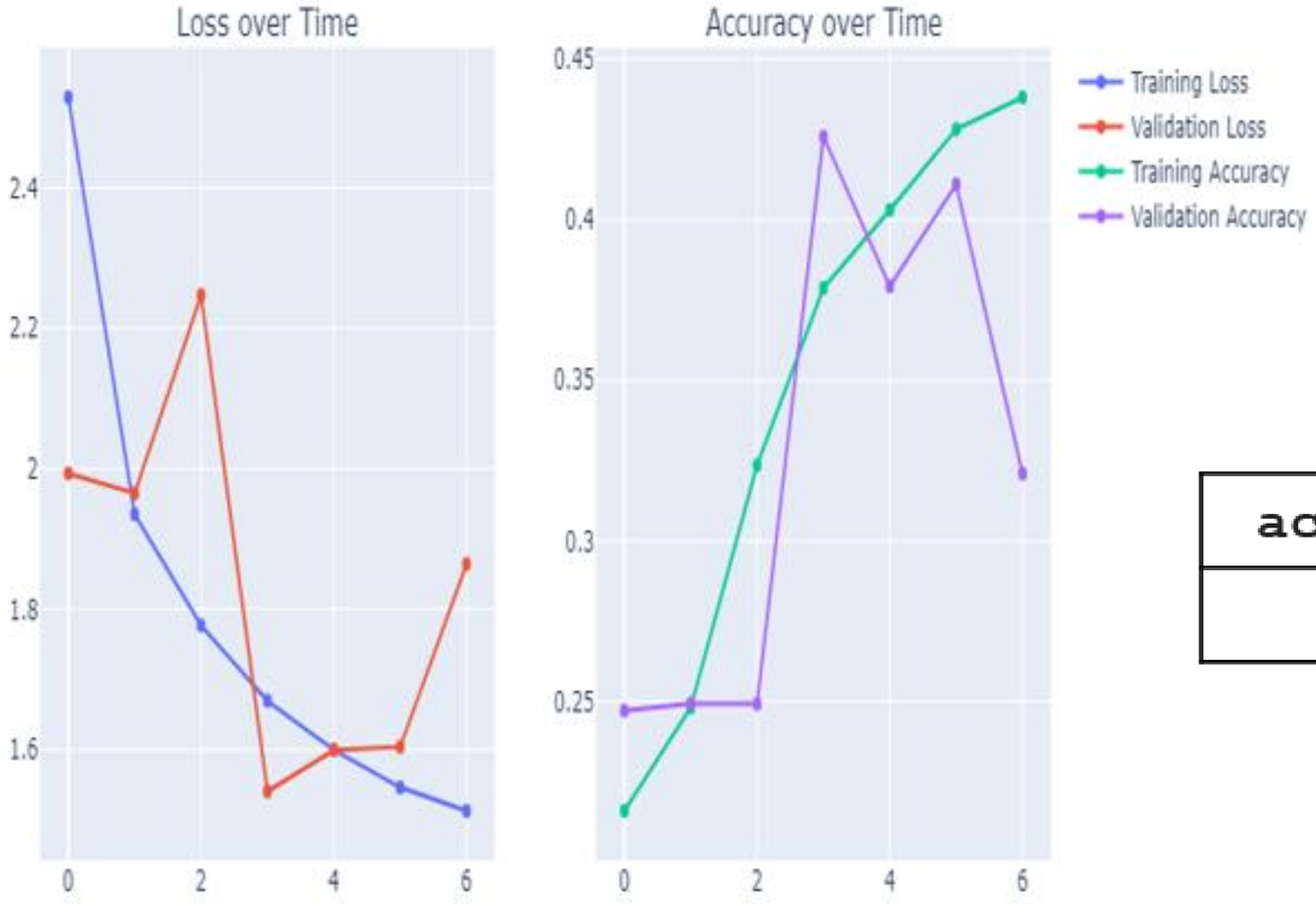


Fig 3: the results for the first model

Experiments

Experiment #1



accuracy	Val loss	Val accuracy
0.43	1.86	0.32

Fig 4: the results for Experiment 1

Experiment #2

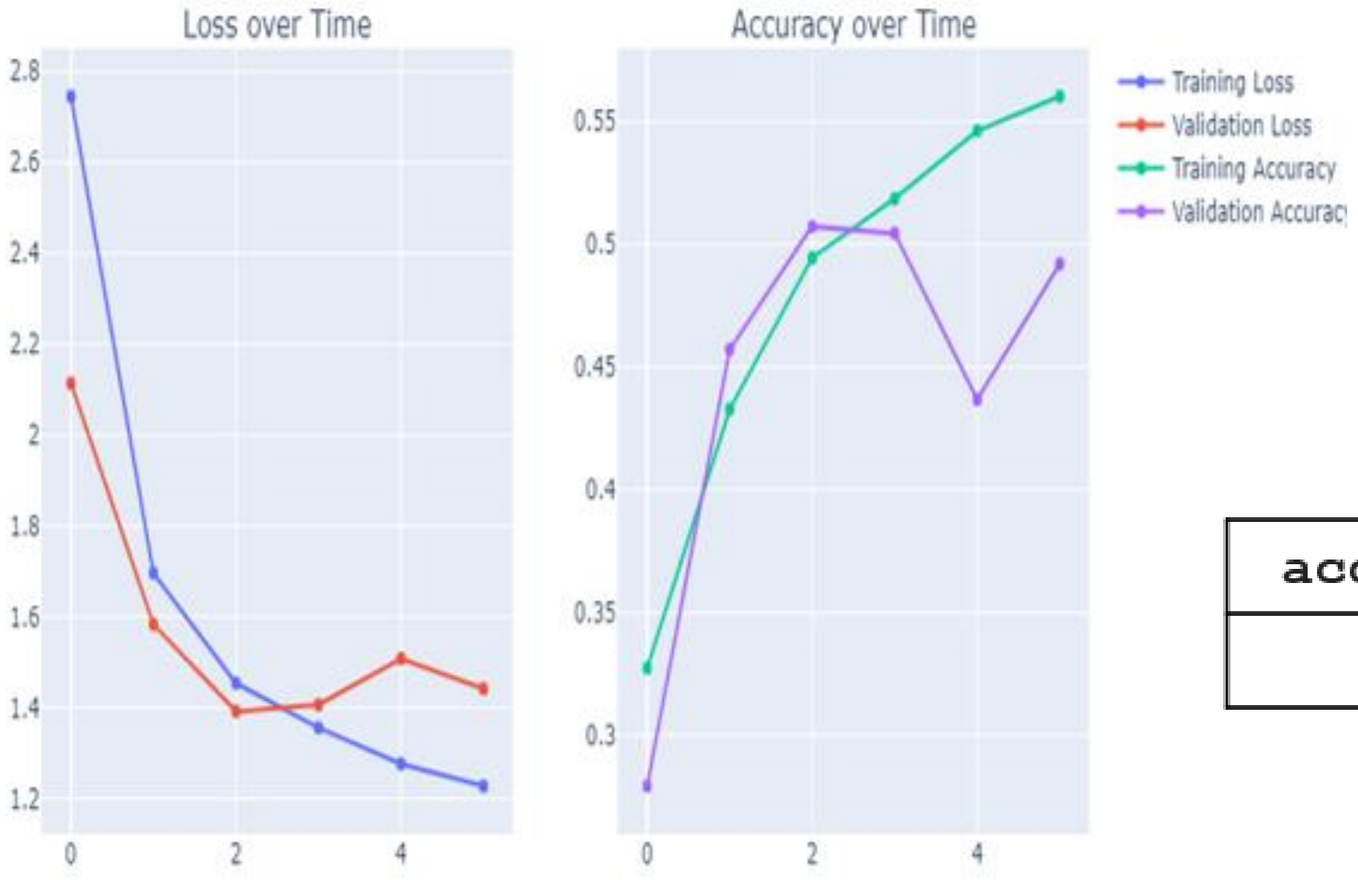


Fig 5: the results for Experiment 2

accuracy	Val loss	Val accuracy
0.56	1.44	0.45

Experiment #3

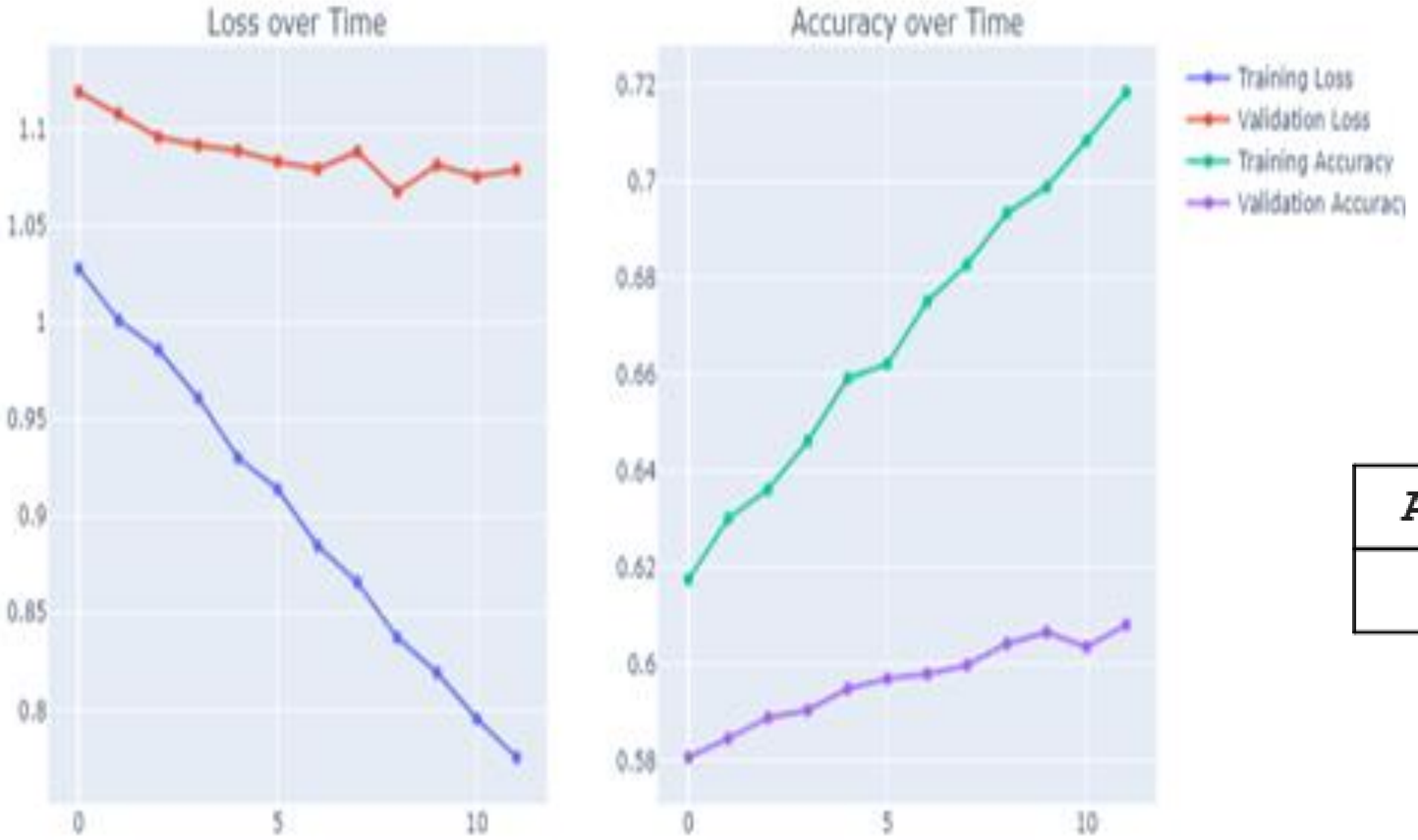
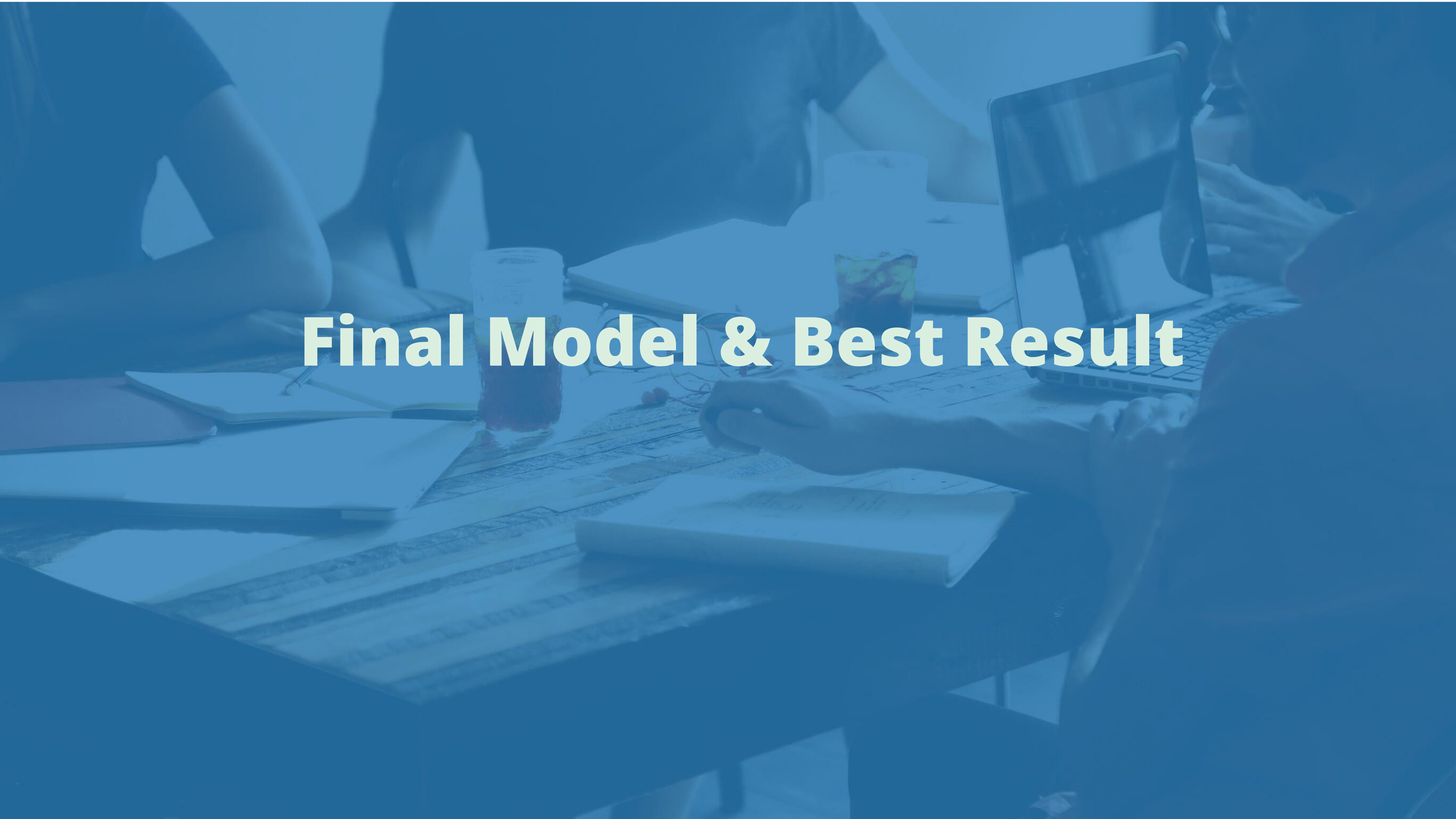


Fig 6: the results for Experiment 3

Accuracy	Val loss	Val accuracy
0.71	1.07	0.60



Final Model & Best Result

VGG16 with Transfer Learning

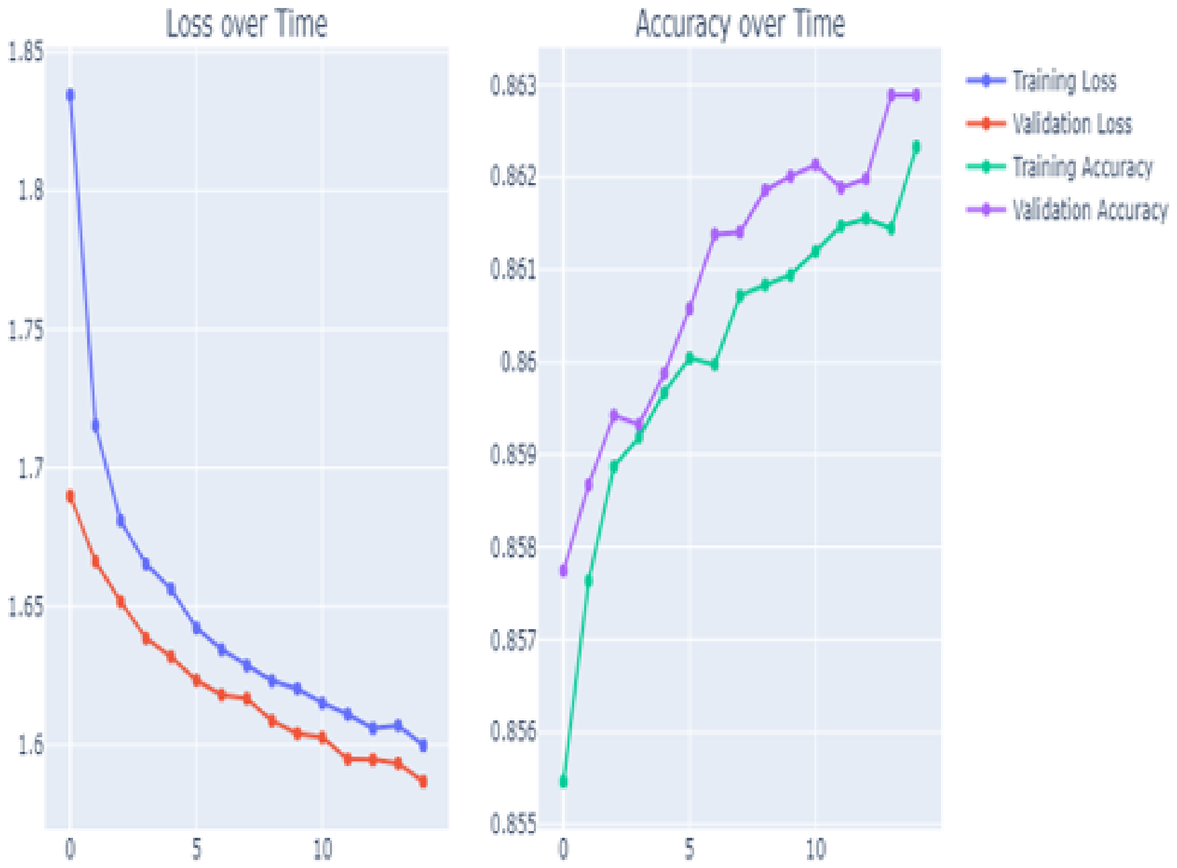


Fig 7: the results for VGG16 Model

(Hyper) Parameter	Setting
Epochs E	15
Batch Size	64
Learning Rate	0.0001
`Weights`	`ImageNet`
Activation Function	RELU, SoftMax
Optimizer	Adam Algorithm
Loss Function	Categorical cross entropy
Metrics	Accuracy

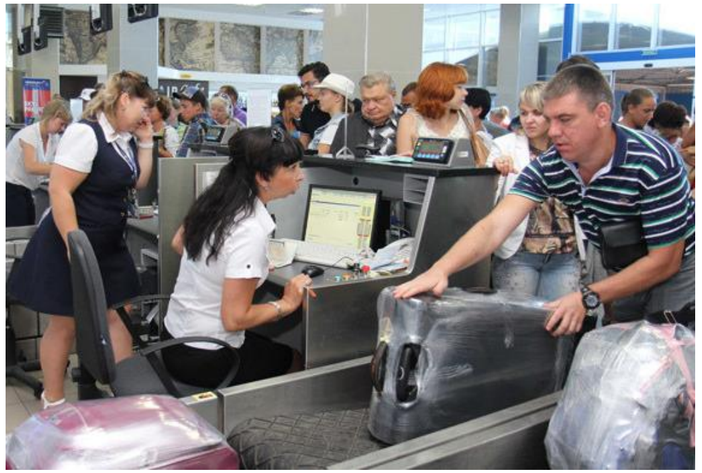
Best Results

Test Accuracy: 0.86

Future Work

Crime Investigation

Airports Inspection



Customer satisfaction

Digital Advertising

Conclusion

- Build a Convolutional Neural Network (CNN) and VGG16 by Transfer Learning models to get the best result to apply on facial emotion recognition.
- Facial emotion recognition can be used on jobs interviews field by Human Resources and Social Development.
- Easier to find the person whose personality and characteristics are best suited to the job.

THANKS!

Do you have any question?