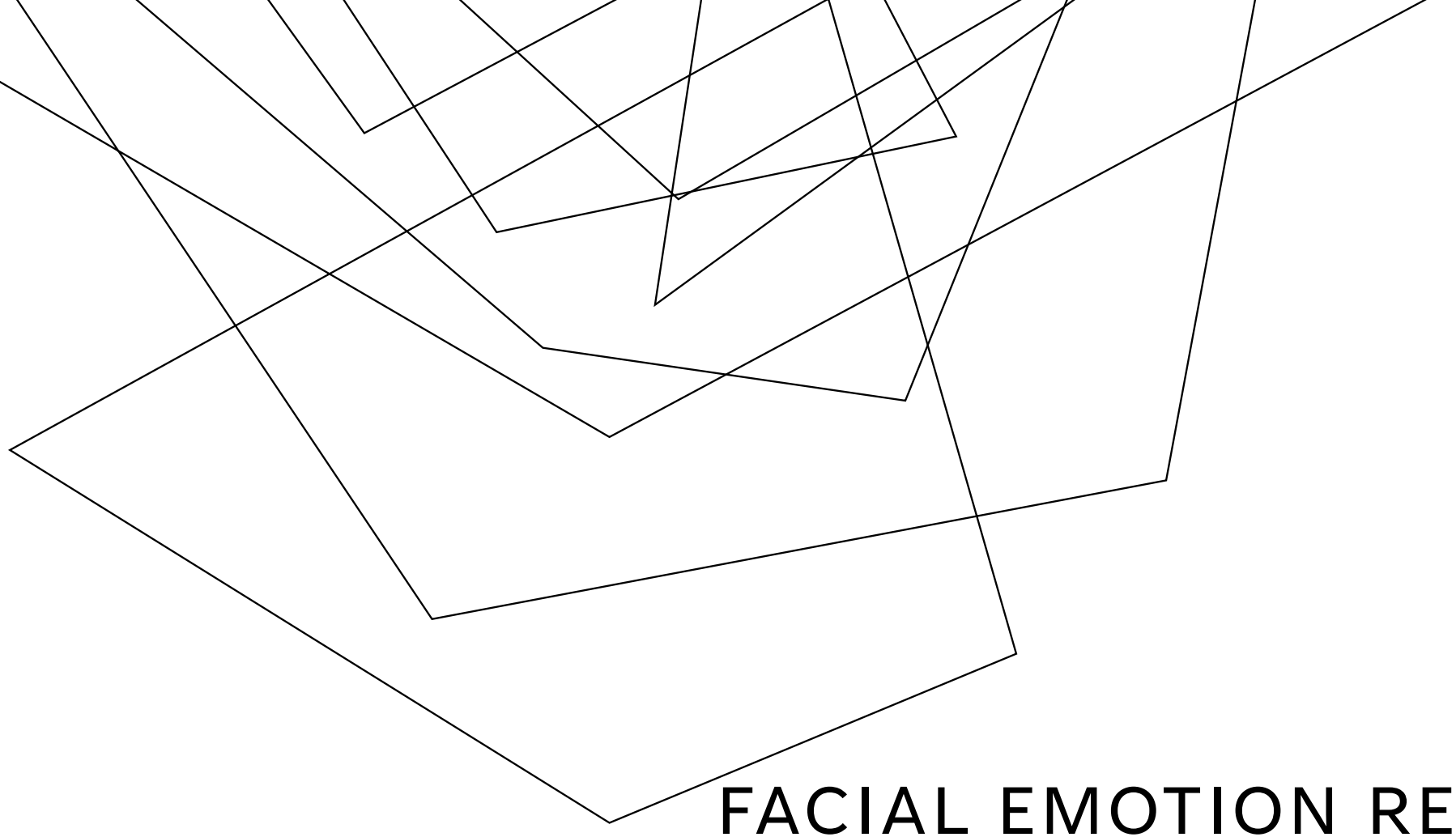

FACIAL EMOTION RECOGNITION

GROUP S

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AGENDA

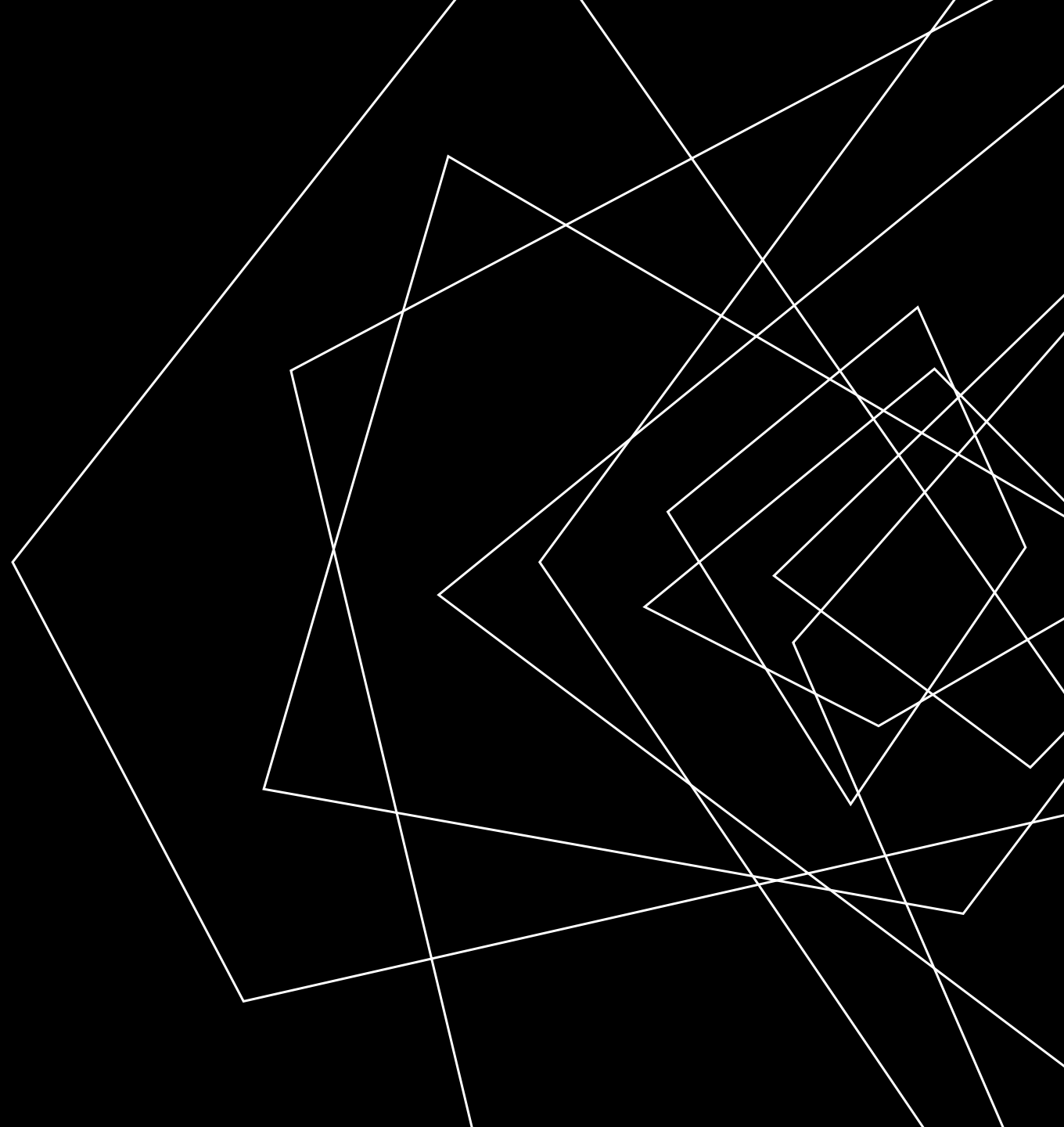
Introduction

Problem and Goals

Type of Data

Methodologies

Results and References



INTRODUCTION

- A person's expression can reveal their mood, and facial emotion analysis has been used in a number of industries, including robotics, safety, and other communication interfaces.
- For this project Multiple models have been trained to better understand the difference in performance of various models across various datasets.
- We have used combination of 3 Different CNN Achitecture with 3 datasets making 9 combinations.
- To better measure and compare the performance of the models we have used different techniques like Augmentation and Hyperparameter Tuning.

PROBLEMS

- Low Accuracy
- Imbalanced Datasets
- Longer Training time
- Overfitting
- Exploding gradient
- Feature Extraction using TSNE
- Variance of Lights

GOALS

- To overcome the problems like Imbalanced Dataset and Variance of Lights we used different Augmentation Techniques on datasets as per model's requirements.
- Gradient clipping was used after every iteration to prevent the problem of Exploding Gradient for specific learning rates.
- To improve the training time as well as the accuracy hyperparameters were finetuned.
- To observe the performance differences between all the models.

TYPE OF DATA

	Dataset 1 – FerCustom	Dataset 2 – AffectNetHQ	Dataset 3 - BW
Number of Classes	3	7	6
Number of Images	4500	10,500	9000
Image Size	64 x 64	512 x 512	48 x 48
Image Type	RGB	RGB	BW
Sample Image			

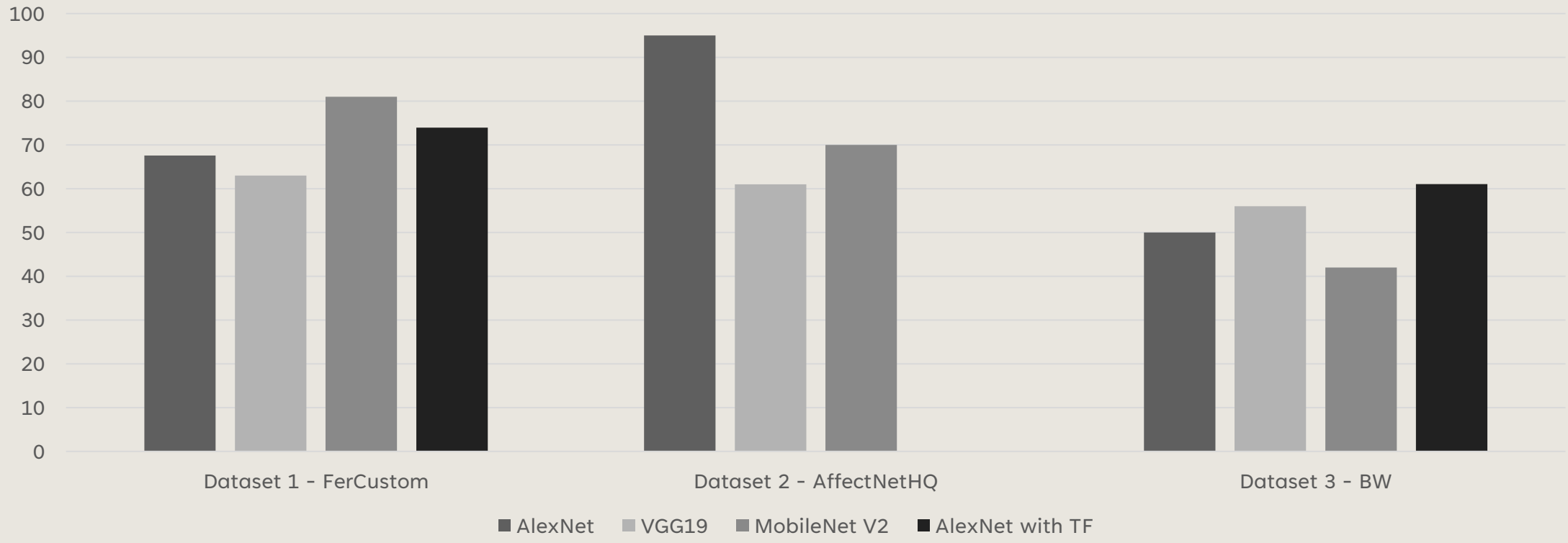
METHODOLOGIES

- To achieve the above mentioned goals we trained 3 different CNN models combined with 3 different datasets. All datasets have variable number of classes.
- The concept of transfer learning is applied on 2 models. i.e Alexnet with FerCustom and BW Datasets.
- We have plotted the output results for all the models to better understand the performance difference.

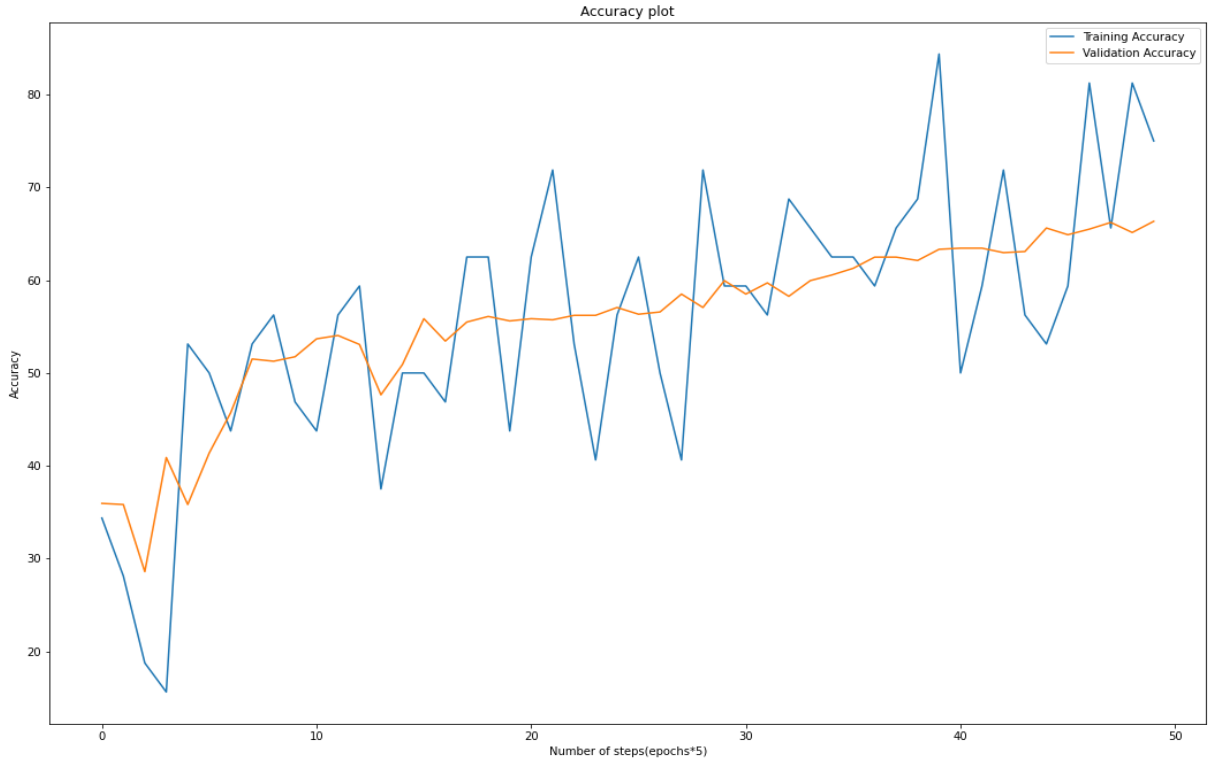
Datasets
FerCustom
AffectNetHQ
BW

Models
AlexNet
VGG19
MobileNet V2

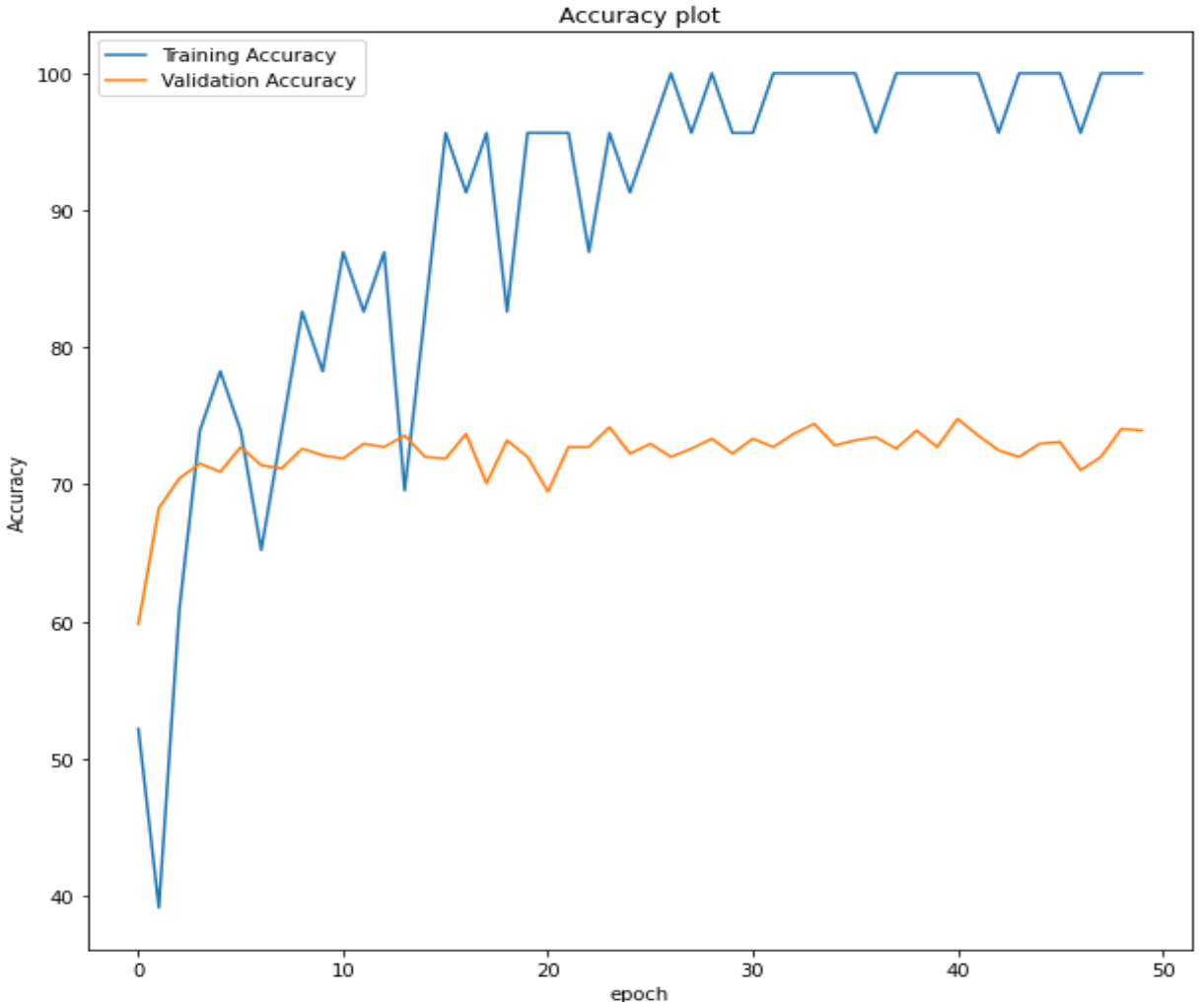
OBTAINED RESULTS



OUTPUT FINDINGS



AlexNet FerCustom



AlexNet FerCustom with TF

REFERNCES

1. A Review Paper on Face Recognition Techniques. Sujata G. Bhele and V. H. Mankar
2. https://www.mdpi.com/2078-2489/10/12/375
3. https://www.frontiersin.org/articles/10.3389/fpsyg.2021.627561/full
4. http://noiselab.ucsd.edu/ECE228_2018/Reports/Report7.pdf
5. https://arxiv.org/pdf/1710.01494.pdf
6. A. Sharma, O. Tuzel, and D. W. Jacobs. Deep hierarchical parsing for semantic segmentation. In The IEEE Conference on Computer Vision and Pattern Recognition, pages 530–538, 2015
7. A. Krizhevsky, I. Sutskever, and G. E. Hinton. Imagenet classification with deep convolutional neural networks. In Advances in neural information processing systems, pages 1097–1105, 2012.09:13 PM