

## Weekly Progress Report - 9

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Project Title	Combating Digital Misinformation: Deepfake Detection Using Deep Neural Networks
Name of the Supervisor (Mentor) at PDEU	Dr. Samir Patel
Week Number	Week 9

### Progress made in Week:

The week was fully dedicated to executing the definitive training run for the project's core detection model, leveraging the optimization results from the previous week.

### Final Training Run with Optimized XceptionNet

- **Model Used:** Fine-tuned XceptionNet.
- **Configuration:** The final, full-epoch training run was conducted using the **best set of hyperparameters** (Learning Rate, Weight Decay, and Augmentation strengths) identified by the Optuna study in Week 8.
- **Objective:** To maximize the model's performance and generalization capacity on the training data.
- **Performance Achievement:** The optimal parameters successfully utilized the model's capacity, resulting in strong, stable validation performance:
- **Artifact:** The final best-performing model weights were saved (final\_xception\_optuna.pth) and are ready for the crucial final evaluation stage.

#### Evaluation Results

Test Loss: 0.1966

Accuracy: 0.9552

AUC: 0.9908

#### Confusion Matrix:

```
[[1416  84]
```

```
[ 50 1441]]
```

#### Classification Report:

```
precision recall f1-score support
```

```
Real    0.9659  0.9440  0.9548   1500
```



```
Fake    0.9449  0.9665  0.9556   1491
```

...

```
accuracy                0.9552   2991
```

```
macro avg   0.9554  0.9552  0.9552   2991
```

```
weighted avg   0.9554  0.9552  0.9552   2991
```

Hetanshi Bhatt	Kunal Solanki	Samir Patel
		
Name and Signature of Student 1	Name and Signature of Student 2	Name and Signature of Supervisor (Mentor)