



## Weekly Progress Report - 4

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<b>Project Title</b>	Combating Digital Misinformation: Deepfake Detection Using Deep Neural Networks
<b>Name of the Supervisor (Mentor) at PDEU</b>	Dr. Samir Patel
<b>Week Number</b>	Week 4

### Progress made in Week:

This week, we concentrated on setting up the foundation for model development, designing the detection pipeline, and preparing for evaluation:

- Model Research & Selection:**  
 Conducted in-depth research on advanced CNN architectures like XceptionNet and EfficientNet for spatial feature extraction. Additionally, explored integrating RNN/LSTM layers to capture temporal relationships between video frames for more accurate detection.
- Pipeline Design & Integration:**  
 Designed a modular deep learning workflow that connects all stages: data preprocessing, model training, and evaluation, ensuring scalability and easier debugging in later stages.
- Evaluation Metrics Setup:**  
 Identified and finalized key performance metrics, including Accuracy, Precision, Recall, F1-Score, and ROC-AUC, to comprehensively assess model reliability and robustness.
- Initial Model Implementation:**  
 Built and tested a baseline CNN model using a subset of the processed dataset. Early testing provided insights into data distribution and potential improvements in preprocessing techniques.
- Future Planning:**  
 Planned the next steps, such as hyperparameter tuning, training optimization, experimenting with combined CNN-LSTM models, and implementing visualizations to highlight manipulated regions in videos for explainability.

<b>Hetanshi Bhatt</b>	<b>Kunal Solanki</b>	<b>Samir Patel</b>
		
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