

Supplementary Material Facial Micro-Expression Based Deepfake Detection Using Temporal Convolutional Networks

Table I: Demographic Distribution

This table provides an overview of the demographic composition of all datasets used, highlighting ethnicity proportions and sample counts.

Source	Clips	Asian(%)	Caucasian(%)	Other(%)
CASME II	247	85	10	5
SAMM	159	70	20	10
FaceForensics++	1000	60	30	10
DFDC	NA	mixed	mixed	mixed
Celeb-DF	NA	mixed	mixed	mixed
Total	1500	60	25	15

Table V: Ablation Study Results

This table shows how removing specific feature groups affects model performance. The full model performs best, demonstrating that each component contributes to detection accuracy.

Setting	Accuracy(%)	AUC
Full Model	91.7	0.96
Without Optical Flow	88.6	0.92
Without Action Units	87.3	0.90
Without TCN (LSTM)	86.1	0.89

Table VI: Frame Rate Sensitivity

This table summarizes how different frame rates influence detection performance. Higher frame rates capture micro-expression cues more effectively.

FrameRate	Accuracy(%)	F1
25 FPS	81.3	0.79
30 FPS	84.5	0.83
60 FPS	89.7	0.88
100 FPS	91.7	0.91

Table IX: Dataset-wise Accuracy

This table compares performance across multiple datasets, showing that the proposed TCN model consistently outperforms ViViT and 3D-CNN baselines.

Dataset	ViViT	3D-CNN	TCN(Ours)
CASME II	84.2	85.1	89.7
SAMM	86.9	88.0	92.5
FaceForensics++	88.1	87.4	90.8
DFDC	80.5	78.5	85.4
Celeb-DF	83.2	80.1	88.7

Table XI: Comparison With Prior Work

This table compares our method with recent deepfake detection techniques. Our TCN approach is the only one using both micro-expression cues and temporal modeling.

Method	Type	Micro-Expression	Temporal
XceptionNet	CNN	No	No
Guera et al.	CNN+LSTM	No	Yes
ViViT	Transformer	No	Yes
MicroExpNet	CNN	Yes	No
TCN (Ours)	TCN	Yes	Yes

Table XII: Robustness Tests

This table provides robustness results under simulated challenging conditions such as low-light and motion. Baseline accuracy is shown; other measurements can be expanded.

Condition	Accuracy(%)	AUC
Baseline (60FPS)	91.7	0.96
Low-light	NA	NA
Moderate head motion	NA	NA
Fast head motion	NA	NA
Motion blur	NA	NA

Table XIII: Compression Robustness

This table evaluates performance across different video compression levels. Accuracy decreases as bitrate is reduced, reflecting realistic streaming constraints.

Bitrate(kbps)	Accuracy(%)	AUC
5000	91.7	0.96
1500	89.2	0.94
800	85.4	0.91
300	79.0	0.86