Supplementary File for
WiFi CSI Based Temporal Activity Detection Via Dual Pyramid Network

1 Introduction

In this supplementary material, we add and discuss the additional frequency-aware evaluation and the cross-person evaluation to clarify our method.

2 Frequency-aware Evaluation

To better support our claim on the different sensitivity of Transformer and CNN from the frequency angle, we built one CNN and one Transformer with comparable parameters as the feature extractor. We set 1/4 of the frequency spectrum as the low- and high-frequency boundary and tested each model in low- and high-frequency bands, measuring their sensitivity through reductions in MAP values. Our results are displayed below:

Frequency Band	MAP Reduction (TF)	MAP Reduction (CNN)
(0, 1)	0%	0%
(0, 1/4)	1.82%	4%
(0, 1/8)	7.47%	13.49%
(0, 1/9)	9.17%	16.17%
(0, 1/16)	29.2%	31.1%

Table 1: Frequency Band Analysis: AMP and MAP Reduction Results

Frequency Band	MAP Reduction (TF)	MAP Reduction (CNN)
(0, 1)	0%	0%
(1/4, 1)	83.35%	68.14%
(1/2, 1)	82.99%	70.09%
(3/4, 1)	83.02%	71.10%

Table 2: Frequency Band Analysis: AMP and MAP Reduction Results for Higher Bands

The results indicate that the Transformer is more sensitive to low-frequency information, while the CNN is more responsive to high-frequency variations.

3 Cross-Person Evaluation

In the main paper, we did not include cross-person evaluation. Hence, we conduct complementary evaluation on unseen subjects here. We conducted leave-one-group-out validation, following the protocol of using 70% for training and 30% for testing. Ten volunteers are divided into a fixed 3:3:4 combination with non-overlapping IDs. Two groups ("3+3") are used for training, and the remaining group ("4") for testing, simulating unseen samples. We compare our model with Dyfadet, ActionFormer, and THAT, repeating the procedure three times. The summarized results are shown in the table below. Results clear show the consistent advantage of the proposed method against the baseline methods.

Metric	THAT	Dyfadet	Actionformer	Ours
mAP0.3	18±0.81	65.91±7.33	59.91±6.1	75.05±3.56
mAP0.4	17.36±0.84	63.79±8.44	57.41±6.8	72.01±5.83
mAP0.5	14.28±0.96	60.1±9.34	54.49±7.95	68.15±6.09
mAP0.6	8.45±1.56	50.72±6.42	45.9±6.61	61.16±5.88
mAP0.7	5.04±0.42	33.01±3.34	31.7±4.1	44.36±4.26
Avg.	12.63±0.77	54.71±6.89	49.88±6.29	64.15±5.1

Table 3: Performance Comparison Across Different Models