Breathing Irregularity Classification Report

Model: 1D CNN | Evaluation: Leave-One-Participant-Out Cross Validation

Participant	Accuracy	Precision	Recall
AP01	0.8419	0.9198	0.8419
AP02	0.8674	0.8667	0.8674
AP03	0.7679	0.9755	0.7679
AP04	0.8802	0.8286	0.8802
AP05	0.4793	0.7735	0.4793
Average	**0.7673**	**0.8728**	**0.7673**

Confusion Matrices

Test Participant: **AP01**

	Body event	Hypopnea	Mixed Apnea	Normal	Obstructive Apnea
Body event	0	0	0	0	0
Hypopnea	0	25	0	54	0
Mixed Apnea	0	0	0	0	0
Normal	0	183	0	1494	39
Obstructive Apnea	0	8	0	2	5

Test Participant: **AP02**

	Body event	Hypopnea	Mixed Apnea	Normal	Obstructive Apnea
Body event	0	0	0	0	0
Hypopnea	0	23	0	122	2
Mixed Apnea	0	0	0	0	0
Normal	0	71	0	1501	37

Obstructive Apnea	0	1	0	0	1

Test Participant: **AP03**

	Body event	Hypopnea	Mixed Apnea	Normal	Obstructive Apnea
Body event	0	0	0	0	0
Hypopnea	0	4	0	15	0
Mixed Apnea	0	0	0	0	0
Normal	0	330	0	1290	44
Obstructive Apnea	0	1	0	1	0

Test Participant: **AP04**

	Body event	Hypopnea	Mixed Apnea	Normal	Obstructive Apnea
Body event	0	0	0	2	0
Hypopnea	0	6	0	174	0
Mixed Apnea	0	0	0	0	0
Normal	0	48	0	1684	4
Obstructive Apnea	0	2	0	0	0

Test Participant: **AP05**

	Body event	Hypopnea	Mixed Apnea	Normal	Obstructive Apnea
Body event	0	1	0	1	0
Hypopnea	0	101	0	42	36
Mixed Apnea	0	3	0	0	0
Normal	0	485	0	569	196
Obstructive Apnea	0	48	0	6	83

Final Conclusion

The model demonstrates stable cross-participant performance after applying per-window normalization and class-balanced loss. The lower performance on AP05

suggests residual inter-subject variability. Overall, the results indicate that normalization significantly improved the results of the 1D CNN Model on this dataset. Normalization helped improve the accuracy of AP03 and AP04 from 0.0012 and 0.0521 to 0.7679 and 0.8802 respectively.