

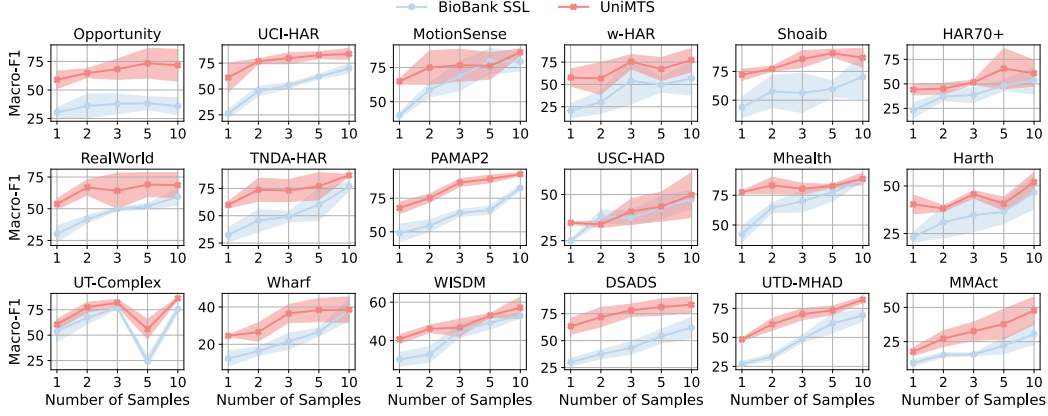


Figure 1: Few-shot fine-tuning results. UniMTS consistently outperforms BioBank SSL (Yuan et al. 2024). We repeat 3 runs and report both mean and standard deviation.

Table 1: We compare the zero-shot performance of IMU2CLIP with a variant of continual training on our synthetic dataset (denoted as IMU2CLIP*). We bold the **best**. The last column shows the average performance across 18 datasets with standard deviation.

Dataset	Metrics	Opportunity	UCI-HAR	MotionSense	w-HAR	Shoaib	HAR70+	RealWorld	TND-HAR	PAMAP2	USC-HAD	Mhealth	Harth	UT-Complex	Wharf	WISDM	DSADS	UTD-MHAD	MMAct	Average
Number of Classes		4	6	6	7	7	7	8	8	12	12	12	12	13	14	18	19	27	35	
Level		Easy								Medium								Hard		Avg
IMU2CLIP	F1	10.3	11.4	8.6	3.3	9.2	1.8	4.5	4.2	1.1	9.3	1.3	1.1	3.4	0.7	2.7	1.1	2.1	1.6	4.3 _(3.6)
IMU2CLIP*	F1	25.5	17.5	27.8	43.7	27.9	16.1	36.4	28.7	29.8	18.6	36.5	12.9	19.8	11.3	13.3	13.3	8.3	7.7	22.0 _(10.2)
UniMTS	F1	42.2	22.0	33.7	42.9	57.2	34.8	36.7	53.7	43.6	27.8	61.8	41.1	29.2	13.7	25.5	27.3	18.5	10.0	34.5 _(14.0)

Table 2: We compare the zero-shot performance of UniMTS with an ablation of incorporating Capture-24 dataset into pre-training (denoted as UniMTS*). We bold the **best**. The last column shows the average performance across 18 datasets with standard deviation.

Dataset	Metrics	Opportunity	UCI-HAR	MotionSense	w-HAR	Shoaib	HAR70+	RealWorld	TND-HAR	PAMAP2	USC-HAD	Mhealth	Harth	UT-Complex	Wharf	WISDM	DSADS	UTD-MHAD	MMAct	Average
Number of Classes		4	6	6	7	7	7	8	8	12	12	12	12	13	14	18	19	27	35	
Level		Easy								Medium								Hard		Avg
UniMTS*	F1	42.8	23.1	43.9	42.1	46.4	41.2	30.0	53.1	51.1	26.1	54.2	19.0	18.7	20.0	28.9	24.1	7.8	12.2	32.5 _(14.2)
UniMTS	F1	42.2	22.0	33.7	42.9	57.2	34.8	36.7	53.7	43.6	27.8	61.8	41.1	29.2	13.7	25.5	27.3	18.5	10.0	34.5 _(14.0)

Table 3: Full-shot performance. We bold the **best**. UniMTS performs better compared with BioBank SSL (Yuan et al. 2024). The last column shows the average performance across 18 datasets with standard deviation.

Dataset	Metrics	Opportunity	UCI-HAR	MotionSense	w-HAR	Shoaib	HAR70+	RealWorld	TND-HAR	PAMAP2	USC-HAD	Mhealth	Harth	UT-Complex	Wharf	WISDM	DSADS	UTD-MHAD	MMAct	Average
Number of Classes		4	6	6	7	7	7	8	8	12	12	12	12	13	14	18	19	27	35	
Level		Easy								Medium								Hard		Avg
BioBank SSL	Acc	85.9	92.7	99.4	93.4	99.1	93.2	75.5	89.4	87.3	65.8	95.1	98.0	96.4	81.4	83.3	65.8	80.5	62.5	85.8 _(11.5)
	F1	86.1	92.9	99.2	81.3	99.1	85.9	68.0	89.6	89.3	72.6	94.0	68.1	96.4	62.7	82.9	83.1	78.4	58.4	82.7 _(12.1)
UniMTS	Acc	88.2	92.1	99.8	98.4	99.7	96.9	84.0	99.6	98.0	58.3	97.0	98.0	99.1	82.7	81.3	94.3	85.6	77.1	90.6 _(10.6)
	F1	89.1	92.2	99.8	98.8	99.7	87.9	81.2	99.6	98.1	63.1	97.3	86.7	99.2	51.7	80.9	94.2	83.2	71.7	87.5 _(13.4)