

**Table 5: Average forecast performance (measured as RMSE over 10 runs) of LPTM and baselines over different domains. The best model is in bold and the second best is underlined.**

Model	Flu-US	Flu-japan	ETT1	ETT2	PEM-Bays	NY-Bike	NY-Taxi	Nasdaq	M3
AutoARIMA	2.14	1344	0.73	0.64	4.1	4.13	16.43	0.62	1.89
Informer	1.62	1139	0.57	0.71	3.1	2.89	12.33	0.83	1.055
Autoformer	1.41	1227	0.72	0.82	2.7	2.73	12.71	0.19	0.887
PatchTST	0.96	1113	0.52	0.63	<b>2.5</b>	2.64	11.95	0.15	<u>0.877</u>
N-HITS	1.42	1211	0.53	0.62	2.9	2.74	11.87	0.57	0.968
MICN	0.95	1145	<b>0.49</b>	<u>0.57</u>	3.6	2.61	11.56	0.13	0.931
TimesNet	1.04	1194	0.56	<u>0.62</u>	3.9	2.83	11.82	0.19	1.055
TiDE	1.21	1876	0.52	0.51	4.6	2.95	12.55	0.24	1.18
iTransformer	1.14	1256	0.57	0.59	4.3	2.83	13.16	0.29	1.125
Time-LLM	1.21	1319	0.52	0.49	3.9	3.7	12.11	0.21	1.064
Autotimes	0.95	1174	0.52	0.47	3.2	2.7	12.37	0.19	0.974
STEP	1.17	983	0.54	0.93	2.7	<u>2.52</u>	<b>10.37</b>	<b>0.11</b>	1.331
EpiFNP	<b>0.52</b>	872	0.81	1.25	4.1	<u>2.98</u>	12.11	0.28	1.281
ColaGNN	1.65	<b>694</b>	0.72	1.19	3.9	3.19	14.97	0.25	1.185
TS2Vec	1.85	905.9	0.99	1.74	3.5	3.11	13.48	0.94	1.344
SimMTM	1.31	1289	0.61	0.55	3.4	3.1	12.79	0.28	1.284
TS-TCC	1.94	1134.6	0.75	1.29	3.3	2.97	15.55	0.76	1.274
LPTM	<u>0.79</u>	<u>704</u>	<b>0.49</b>	<b>0.46</b>	<b>2.5</b>	<b>2.37</b>	<u>11.84</u>	<u>0.17</u>	<b>0.872</b>
LPTM-NoSegment	<u>0.93</u>	<u>766</u>	0.57	0.55	3.2	3.17	<u>14.96</u>	<u>0.27</u>	1.146
LPTM-NoPreTrain	0.96	827	0.46	0.57	3.7	2.66	12.43	0.25	1.271
LPTM-NoLinProb	0.92	885	0.43	0.53	3.1	2.49	12.17	0.19	1.032
LPTM-OnlyRandMask	0.87	895	0.51	0.52	2.8	2.42	12.36	0.21	1.076
LPTM-OnlyLastMask	0.79	773	0.44	0.48	2.7	2.31	12.04	0.19	0.916
Avg. % improv.	NA	NA	0%	4.1%	0%	6.1%	NA	NA	0.5%

**Table 6: Average *zero-shot* forecast performance (measured as RMSE over 10 runs) of LPTM and *pre-trained* baselines. The best model is in bold and the second best is underlined.**

Model	Flu-US	Flu-japan	ETT1	ETT2	PEM-Bays	NY-Bike	NY-Taxi	Nasdaq	M3
Time-LLM	1.38	1411	0.57	0.54	4.3	4.5	13.53	0.29	1.189
Autotimes	1.26	1281	0.57	0.52	33.5	3.9	13.49	0.27	1.163
TS2Vec	1.94	1233.1	1.33	1.82	3.7	4.1	14.39	0.87	1.616
TS-TCC	2.17	1356.15	1.14	1.57	4.1	3.81	15.72	0.92	1.492
LPTM	<b>1.14</b>	<b>996</b>	<b>0.53</b>	<b>0.49</b>	<b>3.4</b>	<b>3.2</b>	<u>13.12</u>	<u>0.22</u>	<b>0.972</b>
Avg. % improv.	9.6%	19.3%	7.1%	5.8%	8.2%	16.1%	2.8%	18.6%	16.5%

**Table 7: Average classification performance (measured as F1 score over 10 runs) of LPTM and baselines over different domains. The best model is in bold and the second best is underlined. The best model is statistically significant over the baselines ( $p \leq 0.05$ ) when it beats the previous state-of-art.**

	BasicMotions	FaceDetection	FingerMovements	PEMS-SF	RacketSports	EigenWorms
Informer	0.95	0.51	0.58	0.67	0.83	0.49
Autoformer	0.93	0.49	0.54	0.71	0.86	0.62
TimesNet	0.92	0.59	0.58	0.84	0.91	0.73
TARNet(SOTA)	<b>1.00</b>	<u>0.63</u>	<u>0.62</u>	<b>0.94</b>	<b>0.98</b>	<u>0.89</u>
TS2Vec	0.99	0.51	0.46	0.75	0.77	0.84
TS-TCC	<b>1.00</b>	0.54	0.47	0.73	0.85	0.77
TST	0.92	0.62	0.59	0.93	0.79	0.72
SimMTM	0.86	0.73	0.68	0.86	0.84	0.82
CRT	0.88	0.78	0.72	0.89	0.87	0.79
LPTM	<b>1.00</b>	<b>0.79</b>	<b>0.78</b>	<u>0.93</u>	<u>0.93</u>	<b>0.94</b>
LPTM-NoSegment	0.98	0.68	0.57	0.66	0.66	0.59
LPTM-NoPreTrain	0.96	0.74	0.62	0.79	0.79	0.63
LPTM-NoLinProb	<b>1.00</b>	0.79	0.69	0.89	0.93	0.92
LPTM-OnlyRandMask	<b>0.98</b>	0.77	0.74	0.91	0.89	0.94
LPTM-OnlyLastMask	<b>1.00</b>	0.76 x	0.72	0.87	0.91	0.89
Avg. % improvement	0%	25.3%	25.8%	NA	NA	5.6%

**Table 8: Accuracy**

	BasicMotions	FaceDetection	FingerMovements	PEMS-SF	RacketSports	EigenWorms
Informer	0.94	0.50	0.57	0.66	0.82	0.48
Autoformer	0.92	0.48	0.53	0.70	0.85	0.61
TimesNet	0.91	0.58	0.57	0.83	0.90	0.72
TARNet(SOTA)	0.99	0.62	0.61	0.93	0.97	0.88
TS2Vec	0.98	0.50	0.45	0.74	0.76	0.83
TS-TCC	0.99	0.53	0.46	0.72	0.84	0.76
TST	0.91	0.61	0.58	0.92	0.78	0.71
SimMTM	0.85	0.72	0.67	0.85	0.83	0.81
CRT	0.87	0.77	0.71	0.88	0.86	0.78
LPTM	0.99	0.78	0.77	0.92	0.92	0.93
LPTM-NoSegment	0.97	0.67	0.56	0.65	0.65	0.58
LPTM-NoPreTrain	0.95	0.73	0.61	0.78	0.78	0.62
LPTM-NoLinProb	0.99	0.78	0.68	0.88	0.92	0.91
LPTM-OnlyRandMask	0.97	0.76	0.73	0.90	0.88	0.93
LPTM-OnlyLastMask	0.99	0.75	0.71	0.86	0.90	0.88

**Table 9: Recall**

Unnamed: 0	BasicMotions	FaceDetection	FingerMovements	PEMS-SF	RacketSports	EigenWorms
Informer	0.91	0.49	0.56	0.64	0.80	0.47
Autoformer	0.89	0.47	0.52	0.68	0.82	0.59
TimesNet	0.88	0.57	0.56	0.81	0.87	0.70
TARNet(SOTA)	1.00	0.60	0.59	0.90	0.96	0.85
TS2Vec	0.98	0.49	0.44	0.72	0.74	0.81
TS-TCC	1.00	0.52	0.45	0.70	0.81	0.74
TST	0.88	0.59	0.57	0.89	0.76	0.69
SimMTM	0.82	0.70	0.65	0.82	0.81	0.79
CRT	0.84	0.75	0.69	0.85	0.83	0.76
LPTM	1.00	0.76	0.75	0.89	0.89	0.90
LPTM-NoSegment	0.96	0.65	0.55	0.63	0.63	0.57
LPTM-NoPreTrain	0.92	0.71	0.59	0.76	0.76	0.60
LPTM-NoLinProb	1.00	0.76	0.66	0.85	0.89	0.88
LPTM-OnlyRandMask	0.96	0.74	0.71	0.87	0.85	0.90
LPTM-OnlyLastMask	1.00	0.73	0.69	0.83	0.87	0.85

**Table 10: Precision**

Unnamed: 0	BasicMotions	FaceDetection	FingerMovements	PEMS-SF	RacketSports	EigenWorms
Informer	0.99	0.53	0.61	0.70	0.87	0.51
Autoformer	0.97	0.51	0.56	0.74	0.90	0.65
TimesNet	0.96	0.62	0.61	0.88	0.95	0.76
TARNet(SOTA)	1.00	0.66	0.65	0.98	1.00	0.93
TS2Vec	1.00	0.53	0.48	0.78	0.80	0.88
TS-TCC	1.00	0.56	0.49	0.76	0.89	0.80
TST	0.96	0.65	0.62	0.97	0.83	0.75
SimMTM	0.90	0.76	0.71	0.90	0.88	0.86
CRT	0.92	0.82	0.75	0.93	0.91	0.83
LPTM	1.00	0.83	0.82	0.97	0.97	0.98
LPTM-NoSegment	1.00	0.71	0.60	0.69	0.69	0.62
LPTM-NoPreTrain	1.00	0.77	0.65	0.83	0.83	0.66
LPTM-NoLinProb	1.00	0.83	0.72	0.93	0.97	0.96
LPTM-OnlyRandMask	1.00	0.80	0.77	0.95	0.93	0.98
LPTM-OnlyLastMask	1.00	0.79	0.75	0.91	0.95	0.93

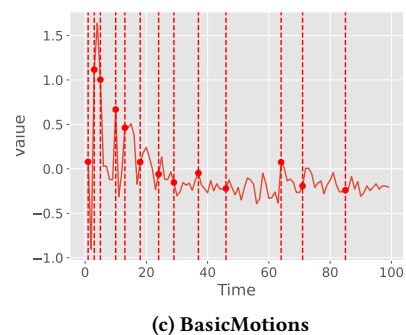
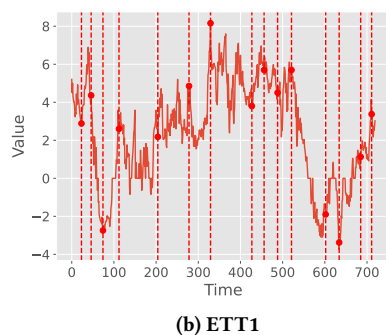
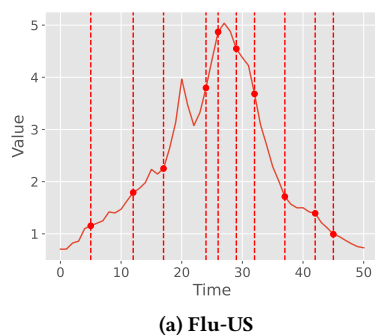
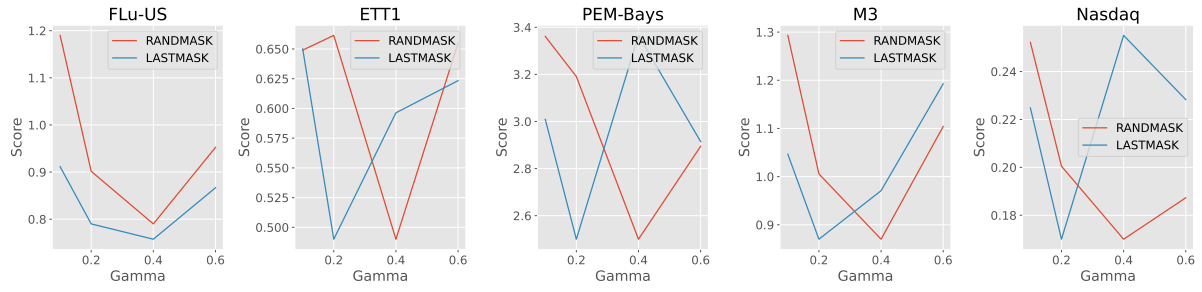


Figure 4: Segmentation learned by LPTM



**Figure 5: Effect of  $\gamma$  on performance(RMSE) for different benchmarks**