Generative ML for time series

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Dataset Name	VQVAE	BT-VQVAE $\gamma = 0.5$	BT-VQVAE $\gamma = 1.0$	BT-VQVAE $\gamma = 2.0$
Wafer	**0.054**	0.072	0.074	0.090
FordA	0.327	**0.114**	0.130	0.133
FordB	0.275	**0.106**	0.108	0.155
StarLightCurves	0.075	0.064	0.039	**0.033**
ChlorineConcentration	**0.024**	0.066	0.059	0.057
TwoPatterns	0.391	**0.206**	0.219	0.261
ECG5000	0.087	0.062	**0.061**	0.085
ElectricDevices	0.071	0.066	**0.060**	0.072
UWaveGestureLibraryAll	0.418	0.245	**0.203**	0.213
ShapesAll	0.110	0.052	**0.040**	0.072

Table 1: Top $\mathcal{L}_{\text{val-recon}}$ ordered by class count. The best results are highlighted in bold.

0.1 Reconstruction

0.2 Classification

Dataset Name	VQVAE	BT-VQVAE $\gamma = 0.5$	BT-VQVAE $\gamma = 1.0$	BT-VQVAE $\gamma = 2.0$
Wafer	98.82	98.88	98.98	**99.09**
FordA	76.21	73.71	73.94	**77.95**
FordB	64.07	63.46	**66.67**	**66.67**
StarLightCurves	93.36	93.32	**93.38**	91.45
ChlorineConcentration	48.75	**55.39**	48.93	55.21
TwoPatterns	73.02	74.85	**75.58**	75.18
ECG5000	84.4	90.87	92.31	**92.38**
ElectricDevices	**57.52**	49.98	51.24	48.79
UWaveGestureLibraryAll	94.08	93.16	93.83	**94.84**
ShapesAll	76.5	76.17	**77.33**	76.83

Table 2: Linear kernel SVM accuracy %. The best results are highlighted in bold.

Dataset Name	VQVAE	BT-VQVAE $\gamma = 0.5$	BT-VQVAE $\gamma = 1.0$	BT-VQVAE $\gamma = 2.0$
Wafer	98.82	98.88	98.98	**99.56**
FordA	**76.21**	73.71	73.94	71.36
FordB	64.07	63.46	**66.67**	62.72
StarLightCurves	93.36	93.32	**93.38**	85.09
ChlorineConcentration	48.75	55.39	48.93	**59.4**
TwoPatterns	73.02	74.85	75.58	**83.15**
ECG5000	84.4	90.87	92.31	**92.76**
ElectricDevices	**57.52**	49.98	51.24	56.7
UWaveGestureLibraryAll	94.08	93.16	93.83	**95.25**
ShapesAll	76.5	76.17	**77.33**	77.0

Table 3: KNN accuracy % for K=1. The best results are highlighted in bold.

Dataset Name	VQVAE	BT-VQVAE $\gamma = 0.5$	BT-VQVAE $\gamma = 1.0$	BT-VQVAE $\gamma = 2.0$
Wafer	98.82	98.88	98.98	**99.17**
FordA	**76.21**	73.71	73.94	75.91
FordB	64.07	63.46	**66.67**	**66.67**
StarLightCurves	93.36	93.32	**93.38**	85.34
ChlorineConcentration	48.75	**55.39**	48.93	55.23
TwoPatterns	73.02	74.85	75.58	**80.15**
ECG5000	84.4	90.87	92.31	**94.13**
ElectricDevices	57.52	49.98	51.24	**59.42**
UWaveGestureLibraryAll	94.08	93.16	93.83	**94.44**
ShapesAll	76.5	76.17	**77.33**	64.5

Table 4: KNN accuracy % for K=5. The best results are highlighted in bold.

Dataset Name	VQVAE	BT-VQVAE $\gamma = 0.5$	BT-VQVAE $\gamma = 1.0$	BT-VQVAE $\gamma = 2.0$
Wafer	98.77	**98.95**	98.85	98.88
FordA	70.23	74.39	75.61	**76.52**
FordB	66.79	**67.65**	64.94	67.04
StarLightCurves	82.86	**84.35**	81.01	83.91
ChlorineConcentration	50.13	55.21	**55.78**	54.24
TwoPatterns	71.95	80.82	**81.6**	78.45
ECG5000	93.8	**94.16**	94.11	93.93
ElectricDevices	52.17	60.01	**62.6**	59.56
UWaveGestureLibraryAll	93.38	92.71	**93.77**	93.58
ShapesAll	58.67	58.67	59.5	**59.33**

Table 5: KNN accuracy % for K=10. The best results are highlighted in bold.