Supplementary material

1 Identifiers of time series

Table 1: Identifiers for SVDB series

800	801	802	803	804	805	806	807
808	809	810	811	812	820	821	822
823	824	825	826	827	828	829	840
841	842	843	844	845	846	847	848
849	850	851	852	853	854	855	856
857	858	859	860	861	862	863	864
866	867	868	869	870	871	872	873
874	875	876	877	878	879	880	882
883	884	885	886	887	888	889	890
891	892	893	894				

Table 2: Identifiers for AIOPS series

KPI-4d2af31a-9916-3d9f-8a8e-8a268a48c095	KPI-6efa3a07-4544-34a0-b921-a155bd1a05e8
KPI-55f8b8b8-b659-38df-b3df-e4a5a8a54bc9	KPI-7103fa0f-cac4-314f-addc-866190247439
KPI-43115f2a-baeb-3b01-96f7-4ea14188343c	KPI-a07ac296-de40-3a7c-8df3-91f642cc14d0
KPI-a8c06b47-cc41-3738-9110-12df0ee4c721	KPI-ab216663-dcc2-3a24-b1ee-2c3e550e06c9
KPI-c69a50cf-ee03-3bd7-831e-407d36c7ee91	KPI-c02607e8-7399-3dde-9d28-8a8da5e5d251
KPI-da10a69f-d836-3baa-ad40-3e548ecf1fbd	KPI-f0932edd-6400-3e63-9559-0a9860a1baa9
KPI-57051487-3a40-3828-9084-a12f7f23ee38	

Table 3: Identifiers for NormA series

Discords_annsgun.test
Discords_dutch_power_demand.test
Discords_patient_respiration1.test
Discords_patient_respiration2.test
Discords_marotta_valve_tek_14.test

Table 4: Identifiers for NAB series

NAB_data_CloudWatch_1	NAB_data_CloudWatch_2
NAB_data_CloudWatch_3	NAB_data_CloudWatch_4
NAB_data_CloudWatch_5	NAB_data_CloudWatch_6
NAB_data_CloudWatch_8	NAB_data_CloudWatch_9
NAB_data_CloudWatch_10	NAB_data_CloudWatch_11
NAB_data_CloudWatch_12	NAB_data_CloudWatch_13
NAB_data_CloudWatch_14	NAB_data_CloudWatch_15
NAB_data_CloudWatch_16	NAB_data_CloudWatch_17
NAB_data_Exchange_1	NAB_data_Exchange_2
NAB_data_Exchange_3	NAB_data_Exchange_4
NAB_data_Exchange_5	NAB_data_Exchange_6
NAB_data_KnownCause_1	NAB_data_KnownCause_2
NAB_data_KnownCause_3	NAB_data_KnownCause_4
NAB_data_KnownCause_5	NAB_data_KnownCause_6
NAB_data_KnownCause_7	NAB_data_Traffic_1
NAB_data_Traffic_2	NAB_data_Traffic_3
NAB_data_Traffic_4	NAB_data_Traffic_5
NAB_data_Traffic_6	NAB_data_Traffic_7
NAB_data_tweets_1	NAB_data_tweets_2
NAB_data_tweets_3	NAB_data_tweets_4
NAB_data_tweets_5	NAB_data_tweets_6
NAB_data_tweets_7	NAB_data_tweets_8
NAB_data_tweets_9	NAB_data_tweets_10

Table 5: Identifiers for UCR series

001_UCR_Anomaly_DISTORTED1sddb40_35000_52000_52620
002_UCR_Anomaly_DISTORTED2sddb40_35000_56600_56900
003_UCR_Anomaly_DISTORTED3sddb40_35000_46600_46900
004_UCR_Anomaly_DISTORTEDBIDMC1_2500_5400_5600
005_UCR_Anomaly_DISTORTEDCIMIS44AirTemperature1_4000_5391_5392
006_UCR_Anomaly_DISTORTEDCIMIS44AirTemperature2_4000_5703_5727
007_UCR_Anomaly_DISTORTEDCIMIS44AirTemperature3_4000_6520_6544
008_UCR_Anomaly_DISTORTEDCIMIS44AirTemperature4_4000_5549_5597
009_UCR_Anomaly_DISTORTEDCIMIS44AirTemperature5_4000_4852_4900
010_UCR_Anomaly_DISTORTEDCIMIS44AirTemperature6_4000_6006_6054
011_UCR_Anomaly_DISTORTEDECG1_10000_11800_12100
012_UCR_Anomaly_DISTORTEDECG2_15000_16000_16100
013_UCR_Anomaly_DISTORTEDECG3_15000_16000_16100
014_UCR_Anomaly_DISTORTEDECG3_8000_17000_17100
015_UCR_Anomaly_DISTORTEDECG4_5000_16800_17100
016_UCR_Anomaly_DISTORTEDECG4_5000_16900_17100
017_UCR_Anomaly_DISTORTEDECG4_5000_17000_17100
018_UCR_Anomaly_DISTORTEDECG4_8000_17000_17100
019_UCR_Anomaly_DISTORTEDGP711MarkerLFM5z1_5000_6168_6212
020_UCR_Anomaly_DISTORTEDGP711MarkerLFM5z2_5000_7175_7388
021_UCR_Anomaly_DISTORTEDGP711MarkerLFM5z3_5000_5948_5993

022_UCR_Anomaly_DISTORTEDGP711MarkerLFM5z4_4000_6527_6645
023_UCR_Anomaly_DISTORTEDGP711MarkerLFM5z5_5000_8612_8716
024_UCR_Anomaly_DISTORTEDInternalBleeding10_3200_4526_4556
025_UCR_Anomaly_DISTORTEDInternalBleeding14_2800_5607_5634
026_UCR_Anomaly_DISTORTEDInternalBleeding15_1700_5684_5854
027_UCR_Anomaly_DISTORTEDInternalBleeding16_1200_4187_4199
028_UCR_Anomaly_DISTORTEDInternalBleeding17_1600_3198_3309
029_UCR_Anomaly_DISTORTEDInternalBleeding18_2300_4485_4587
030_UCR_Anomaly_DISTORTEDInternalBleeding19_3000_4187_4197
031_UCR_Anomaly_DISTORTEDInternalBleeding20_2700_5759_5919
032_UCR_Anomaly_DISTORTEDInternalBleeding4_1000_4675_5033
033_UCR_Anomaly_DISTORTEDInternalBleeding5_4000_6200_6370
034_UCR_Anomaly_DISTORTEDInternalBleeding6_1500_3474_3629
035_UCR_Anomaly_DISTORTEDInternalBleeding8_2500_5865_5974
036_UCR_Anomaly_DISTORTEDInternalBleeding9_4200_6599_6681
037_UCR_Anomaly_DISTORTEDLab2Cmac011215EPG1_5000_17210_17260
038_UCR_Anomaly_DISTORTED Lab2Cmac011215EPG2_5000_27862_27932
039_UCR_Anomaly_DISTORTEDLab2Cmac011215EPG3_5000_16390_16420
040_UCR_Anomaly_DISTORTEDLab2Cmac011215EPG4_6000_17390_17520
041_UCR_Anomaly_DISTORTEDLab2Cmac011215EPG5_7000_17390_17520
042_UCR_Anomaly_DISTORTEDLab2Cmac011215EPG6_7000_12190_12420
043_UCR_Anomaly_DISTORTEDMesoplodonDensirostris_10000_19280_19440
044_UCR_Anomaly_DISTORTEDPowerDemand1_9000_18485_18821
045_UCR_Anomaly_DISTORTEDPowerDemand2_14000_23357_23717
046_UCR_Anomaly_DISTORTEDPowerDemand3_16000_23405_23477
047_UCR_Anomaly_DISTORTEDPowerDemand4_18000_24005_24077
048_UCR_Anomaly_DISTORTEDTkeepFifthMARS_3500_5988_6085
049_UCR_Anomaly_DISTORTEDTkeepFirstMARS_3500_5365_5380
050_UCR_Anomaly_DISTORTEDTkeepForthMARS_3500_5988_6085
051_UCR_Anomaly_DISTORTEDTkeepSecondMARS_3500_9330_9340
052_UCR_Anomaly_DISTORTEDTkeepThirdMARS_3500_4711_4809
053_UCR_Anomaly_DISTORTEDWalkingAceleration1_1500_2764_2995
054_UCR_Anomaly_DISTORTEDWalkingAceleration5_2700_5920_5979
055_UCR_Anomaly_DISTORTEDapneaecg2_10000_20950_21100
056_UCR_Anomaly_DISTORTEDapneaecg3_5000_11111_11211
057_UCR_Anomaly_DISTORTEDapneaecg4_6000_16000_16100
058_UCR_Anomaly_DISTORTEDapneaecg_10000_12240_12308
059_UCR_Anomaly_DISTORTEDgait1_20000_38500_38800
060_UCR_Anomaly_DISTORTEDgait2_22000_46500_46800
061_UCR_Anomaly_DISTORTEDgait3_24500_59900_60500
062_UCR_Anomaly_DISTORTEDgaitHunt1_18500_33070_33180
063_UCR_Anomaly_DISTORTEDgaitHunt2_18500_31200_31850
064_UCR_Anomaly_DISTORTEDgaitHunt3_23400_38400_39200
065_UCR_Anomaly_DISTORTEDinsectEPG1_3000_7000_7030
066_UCR_Anomaly_DISTORTEDinsectEPG2_3700_8000_8025
067_UCR_Anomaly_DISTORTEDinsectEPG3_5200_7000_7050
068_UCR_Anomaly_DISTORTEDinsectEPG4_1300_6508_6558
069_UCR_Anomaly_DISTORTEDinsectEPG5_3200_8500_8501
070_UCR_Anomaly_DISTORTEDltstdbs30791AI_17555_52600_52800

071_UCR_Anomaly_DISTORTEDltstdbs30791AS_23000_52600_52800
072_UCR_Anomaly_DISTORTEDltstdbs30791ES_20000_52600_52800
073_UCR_Anomaly_DISTORTEDpark3m_60000_72150_72495
074_UCR_Anomaly_DISTORTEDqtdbSel1005V_4000_12400_12800
075_UCR_Anomaly_DISTORTEDqtdbSel100MLII_4000_13400_13800
076_UCR_Anomaly_DISTORTEDresperation10_48000_130700_131880
077_UCR_Anomaly_DISTORTEDresperation11_58000_110800_110801
078_UCR_Anomaly_DISTORTEDresperation1_100000_110260_110412
079_UCR_Anomaly_DISTORTEDresperation2_30000_168250_168250
080_UCR_Anomaly_DISTORTEDresperation2_30000_168250_168251
081_UCR_Anomaly_DISTORTEDresperation3_45000_158250_158251
083_UCR_Anomaly_DISTORTEDresperation9_38000_143411_143511
084_UCR_Anomaly_DISTORTEDs20101mML2_12000_35774_35874
085_UCR_Anomaly_DISTORTEDs20101m_10000_35774_35874
086_UCR_Anomaly_DISTORTEDsddb49_20000_67950_68200
087_UCR_Anomaly_DISTORTEDsel840mECG1_17000_51370_51740
088_UCR_Anomaly_DISTORTEDsel840mECG2_20000_49370_49740
089_UCR_Anomaly_DISTORTEDtiltAPB1_100000_114283_114350
090_UCR_Anomaly_DISTORTEDtiltAPB2_50000_124159_124985
091_UCR_Anomaly_DISTORTEDtiltAPB3_40000_114000_114370
092_UCR_Anomaly_DISTORTEDtiltAPB4_20000_67995_67996
093_UCR_Anomaly_NOISE1sddb40_35000_52000_52620
094_UCR_Anomaly_NOISEBIDMC1_2500_5400_5600
095_UCR_Anomaly_NOISECIMIS44AirTemperature4_4000_5549_5597
096_UCR_Anomaly_NOISEECG4_5000_16900_17100
097_UCR_Anomaly_NOISEGP711MarkerLFM5z3_5000_5948_5993
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101_UCR_Anomaly_NOISELab2Cmac011215EPG4_6000_17390_17520
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104_UCR_Anomaly_NOISEapneaecg4_6000_16000_16100
105_UCR_Anomaly_NOISEgait3_24500_59900_60500
106_UCR_Anomaly_NOISEgaitHunt2_18500_31200_31850
107_UCR_Anomaly_NOISEinsectEPG3_5200_7000_7050
108_UCR_Anomaly_NOISEresperation2_30000_168250_168250
109_UCR_Anomaly_1sddb40_35000_52000_52620
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117_UCR_Anomaly_CIMIS44AirTemperature5_4000_4852_4900
118_UCR_Anomaly_CIMIS44AirTemperature6_4000_6006_6054
119_UCR_Anomaly_ECG1_10000_11800_12100
120_UCR_Anomaly_ECG2_15000_16000_16100

121_UCR_Anomaly_ECG3_15000_16000_16100
122_UCR_Anomaly_ECG3_800_17000_17100
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124_UCR_Anomaly_ECG4_5000_16900_17100
125_UCR_Anomaly_ECG4_5000_17000_17100
126_UCR_Anomaly_ECG4_8000_17000_17100
127_UCR_Anomaly_GP711MarkerLFM5z1_5000_6168_6212
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129_UCR_Anomaly_GP711MarkerLFM5z3_5000_5948_5993
130_UCR_Anomaly_GP711MarkerLFM5z4_4000_6527_6645
131_UCR_Anomaly_GP711MarkerLFM5z5_5000_8612_8716
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136_UCR_Anomaly_InternalBleeding17_1600_3198_3309
137_UCR_Anomaly_InternalBleeding18_2300_4485_4587
138_UCR_Anomaly_InternalBleeding19_3000_4187_4197
139_UCR_Anomaly_InternalBleeding20_2700_5759_5919
140_UCR_Anomaly_Internalleeding4_1000_4675_5033
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147_UCR_Anomaly_Lab2Cmac011215EPG3_5000_16390_16420
148_UCR_Anomaly_Lab2Cmac011215EPG4_6000_17390_17520
149_UCR_Anomaly_Lab2Cmac011215EPG5_7000_17390_17520
150_UCR_Anomaly_Lab2Cmac011215EPG6_7000_12190_12420
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153_UCR_Anomaly_PowerDemand2_14000_23357_23717
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158_UCR_Anomaly_TkeepForthMARS_3500_5988_6085
159_UCR_Anomaly_TkeepSecondMARS_3500_9330_9340
160_UCR_Anomaly_TkeepThirdMARS_3500_4711_4809
161_UCR_Anomaly_WalkingAceleration1_1500_2764_2995
162_UCR_Anomaly_WalkingAceleration5_2700_5920_5979
163_UCR_Anomaly_apneaecg2_10000_20950_21100
164_UCR_Anomaly_apneaecg3_5000_11111_11211
165_UCR_Anomaly_apneaecg4_6000_16000_16100
166_UCR_Anomaly_apneaecg_10000_12240_12308
167_UCR_Anomaly_gait1_20000_38500_38800
168_UCR_Anomaly_gait2_22000_46500_46800
169_UCR_Anomaly_gait3_24500_59900_60500

170_UCR_Anomaly_gaitHunt1_18500_33070_33180
171_UCR_Anomaly_gaitHunt2_18500_31200_31850
172_UCR_Anomaly_gaitHunt3_23400_38400_39200
173_UCR_Anomaly_insectEPG1_3000_7000_7030
174_UCR_Anomaly_insectEPG2_3700_8000_8025
175_UCR_Anomaly_insectEPG3_5200_7000_7050
176_UCR_Anomaly_insectEPG4_1300_6508_6558
177_UCR_Anomaly_insectEPG5_3200_8500_8501
178_UCR_Anomaly_ltstdbs30791AI_17555_52600_52800
179_UCR_Anomaly_ltstdbs30791AS_23000_52600_52800
180_UCR_Anomaly_ltstdbs30791ES_20000_52600_52800
181_UCR_Anomaly_park3m_60000_72150_72495
182_UCR_Anomaly_qtdbSel1005V_4000_12400_12800
183_UCR_Anomaly_qtdbSel100MLII_4000_13400_13800
184_UCR_Anomaly_resperation10_48000_130700_131880
185_UCR_Anomaly_resperation11_58000_110800_110801
186_UCR_Anomaly_resperation1_100000_110260_110412
187_UCR_Anomaly_resperation2_30000_168250_168250
188_UCR_Anomaly_resperation2_30000_168250_168251
189_UCR_Anomaly_resperation3_45000_158250_158251
190_UCR_Anomaly_resperati on4_70000_128430_128431
191_UCR_Anomaly_resperation9_38000_143411_143511
192_UCR_Anomaly_s20101mML2_12000_35774_35874
193_UCR_Anomaly_s20101m_10000_35774_35874
194_UCR_Anomaly_sddb49_20000_67950_68200
195_UCR_Anomaly_sel840mECG1_17000_51370_51740
196_UCR_Anomaly_sel840mECG2_20000_49370_49740
197_UCR_Anomaly_tiltAPB1_100000_114283_114350
198_UCR_Anomaly_tiltAPB2_50000_124159_124985
199_UCR_Anomaly_tiltAPB3_40000_114000_114370
200_UCR_Anomaly_tiltAPB4_20000_67995_67996
201_UCR_Anomaly_CHARISfive_10000_17001_17016
202_UCR_Anomaly_CHARISfive_10411_10998_11028
203_UCR_Anomaly_CHARISfive_10500_10995_11028
204_UCR_Anomaly_CHARISfive_12412_15000_15070
205_UCR_Anomaly_CHARISfive_9812_28995_29085
206_UCR_Anomaly_CHARISten_25130_29080_29140
207_UCR_Anomaly_CHARISten_3165_26929_26989
208_UCR_Anomaly_CHARISten_5130_27929_27989
209_UCR_Anomaly_Fantasia_19000_26970_27270
210_UCR_Anomaly_Italianpowerdemand_36123_74900_74996
211_UCR_Anomaly_Italianpowerdemand_38113_39240_39336
212_UCR_Anomaly_Italianpowerdemand_8913_29480_29504
213_UCR_Anomaly_STAFFIIIDatabase_33211_126920_127370
214_UCR_Anomaly_STAFFIIIDatabase_34211_125720_126370
215_UCR_Anomaly_STAFFIIIDatabase_36276_106720_107370
216_UCR_Anomaly_STAFFIIIDatabase_37216_160720_161370
217_UCR_Anomaly_STAFFIIIDatabase_38211_150720_151370
218_UCR_Anomaly_STAFFIIIDatabase_41117_210720_211370

219_UCR_Anomaly_STAFFIIIDatabase_41612_64632_64852
220_UCR_Anomaly_STAFFIIIDatabase_43217_250720_251370
221_UCR_Anomaly_STAFFIIIDatabase_45616_163632_164852
222_UCR_Anomaly_mit14046longtermecg_56123_91200_91700
223_UCR_Anomaly_mit14046longtermecg_74123_131200_131700
224_UCR_Anomaly_mit14046longtermecg_76123_191200_191700
225_UCR_Anomaly_mit14046longtermecg_81214_143000_143300
226_UCR_Anomaly_mit14046longtermecg_96123_123000_123300
227_UCR_Anomaly_mit14134longtermecg_11231_29000_29100
228_UCR_Anomaly_mit14134longtermecg_11361_47830_47850
229_UCR_Anomaly_mit14134longtermecg_16363_57960_57970
230_UCR_Anomaly_mit14134longtermecg_19363_19510_19610
231_UCR_Anomaly_mit14134longtermecg_8763_47530_47790
232_UCR_Anomaly_mit14134longtermecg_8763_57530_57790
233_UCR_Anomaly_mit14157longtermecg_18913_24500_24501
234_UCR_Anomaly_mit14157longtermecg_18913_24600_24601
235_UCR_Anomaly_mit14157longtermecg_18913_75450_75451
236_UCR_Anomaly_mit14157longtermecg_19313_46350_46390
237_UCR_Anomaly_mit14157longtermecg_19313_89560_90370
238_UCR_Anomaly_mit14157longtermecg_21311_72600_72780
242_UCR_Anomaly_tilt12744mtable_100000_104630_104890
243_UCR_Anomaly_tilt12744mtable_100000_203355_203400
244_UCR_Anomaly_tilt12754table_100013_104630_104890
245_UCR_Anomaly_tilt12754table_100211_270800_271070
246_UCR_Anomaly_tilt12755mtable_100211_270800_271070
247_UCR_Anomaly_tilt12755mtable_50211_121900_121980
248_UCR_Anomaly_weallwalk_2000_4702_4707
249_UCR_Anomaly_weallwalk_2753_8285_8315
250_UCR_Anomaly_weallwalk_2951_7290_7296

2 Results of pre-treatment

Table 6: Comparison, in terms of AUCROC, of the average ranks of the normalisations according to the algorithm applied and the approach used (''TS'': application of windowing, ''FE'': application of windowing and calculation of statistics).

			Without Normalisation	MinMax	MedianIQR	MeanStd
SVDB	IF	TS	2.079	1.893	3.360	2.668
		FE	1.887	2.487	3.128	2.498
	LOF	TS	2.278	2.679	2.141	2.901
		FE	1.880	2.258	2.258	3.604
AIOPS + NormA	IF	TS	1.889	2.285	2.486	3.340
		FE	2.104	2.938	2.556	2.403
	LOF	TS	1.694	2.986	2.604	2.715
		FE	2.618	2.611	2.465	2.306

3 Comparison of the performance of the IF and LOF algorithms

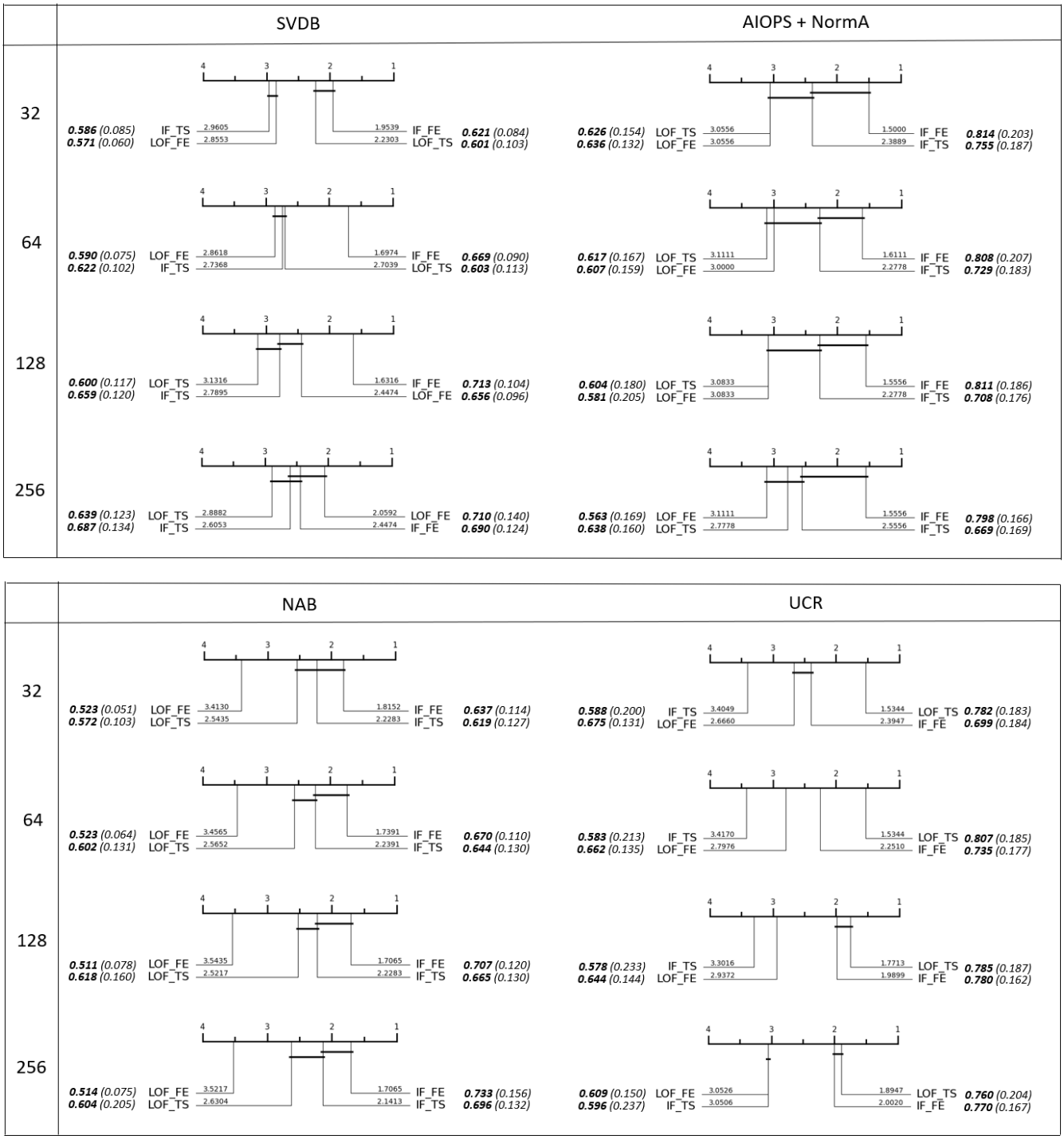

Figure 1: Critical difference diagrams