

Supplementary material for the paper titled
“Early classification of time series by
simultaneously optimizing the accuracy and
earliness”

Raw results for the 4 combinations of the proposed
method

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Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	0.59	0.61	0.62	0.66
Adiac	0.49	0.50	0.60	0.60
Beef	0.37	0.53	0.53	0.53
CBF	0.89	0.89	0.89	0.89
ChlorineConcentration	0.56	0.56	0.58	0.65
CinC_ECG_torso	0.52	0.82	0.81	0.82
Coffee	0.46	0.46	0.93	0.93
Cricket_X	0.52	0.57	0.57	0.61
Cricket_Y	0.63	0.63	0.66	0.71
Cricket_Z	0.60	0.63	0.63	0.63
DiatomSizeReduction	0.81	0.78	0.78	0.78
ECG200	0.85	0.85	0.86	0.88
ECGFiveDays	0.62	0.62	0.62	0.66
FaceAll	0.85	0.85	0.85	0.88
FaceFour	0.91	0.91	0.91	0.92
FacesUCR	0.72	0.72	0.78	0.78
fish	0.74	0.71	0.86	0.86
Gun_Point	0.93	0.93	0.93	0.93
Haptics	0.37	0.38	0.44	0.44
InlineSkate	0.26	0.26	0.29	0.29
ItalyPowerDemand	0.72	0.83	0.90	0.90
Lighting2	0.66	0.66	0.66	0.61
Lighting7	0.45	0.45	0.44	0.44
MALLAT	0.65	0.65	0.84	0.93
MedicalImages	0.73	0.73	0.74	0.74
MoteStrain	0.78	0.78	0.78	0.78
OliveOil	0.63	0.63	0.63	0.70
OSULeaf	0.48	0.50	0.50	0.52
SonyAIBORobotSurface	0.81	0.81	0.81	0.81
SonyAIBORobotSurfaceII	0.78	0.78	0.78	0.79
StarLightCurves	0.94	0.95	0.95	0.96
SwedhLeaf	0.79	0.79	0.85	0.87
Symbols	0.66	0.66	0.77	0.78
synthetic_control	0.88	0.94	0.94	0.95
Trace	0.68	0.67	0.81	0.81
TwoLeadECG	0.83	0.83	0.83	0.83
Two_Patterns	0.58	0.81	0.83	0.87
uWaveGestureLibrary_X	0.70	0.74	0.75	0.77
uWaveGestureLibrary_Y	0.58	0.60	0.68	0.70
uWaveGestureLibrary_Z	0.65	0.70	0.71	0.73
wafer	0.97	0.97	0.98	0.98
WordsSynonyms	0.35	0.42	0.54	0.58
yoga	0.74	0.78	0.78	0.79
NonInvasiveFatalECG_Thorax1	0.85	0.85	0.88	0.89
NonInvasiveFatalECG_Thorax2	0.88	0.90	0.93	0.94

Table 1: Accuracy values for the SR1-CF1 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.

Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	0.59	0.63	0.65	0.66
Adiac	0.55	0.54	0.56	0.61
Beef	0.50	0.53	0.50	0.57
CBF	0.87	0.87	0.87	0.87
ChlorineConcentration	0.56	0.56	0.57	0.64
CinC_ECG_torso	0.68	0.77	0.82	0.81
Coffee	0.46	0.50	0.93	0.93
Cricket_X	0.59	0.59	0.60	0.60
Cricket_Y	0.65	0.65	0.71	0.72
Cricket_Z	0.63	0.64	0.63	0.66
DiatomSizeReduction	0.88	0.84	0.84	0.84
ECG200	0.83	0.83	0.86	0.88
ECGFiveDays	0.62	0.62	0.62	0.65
FaceAll	0.84	0.85	0.86	0.87
FaceFour	0.91	0.91	0.92	0.91
FacesUCR	0.70	0.71	0.75	0.81
fish	0.72	0.73	0.86	0.86
Gun_Point	0.89	0.93	0.93	0.93
Haptics	0.39	0.40	0.43	0.48
InlineSkate	0.27	0.28	0.27	0.28
ItalyPowerDemand	0.72	0.83	0.90	0.91
Lighting2	0.66	0.66	0.66	0.59
Lighting7	0.44	0.49	0.52	0.53
MALLAT	0.62	0.80	0.83	0.92
MedicalImages	0.75	0.74	0.75	0.74
MoteStrain	0.78	0.78	0.79	0.79
OliveOil	0.60	0.60	0.63	0.67
OSULeaf	0.46	0.48	0.50	0.52
SonyAIBORobotSurface	0.81	0.81	0.81	0.81
SonyAIBORobotSurfaceII	0.79	0.79	0.79	0.78
StarLightCurves	0.94	0.95	0.95	0.96
SwedhLeaf	0.77	0.77	0.83	0.85
Symbols	0.66	0.66	0.66	0.78
synthetic_control	0.85	0.93	0.94	0.95
Trace	0.68	0.67	0.81	0.81
TwoLeadECG	0.81	0.82	0.83	0.83
Two_Patterns	0.67	0.76	0.87	0.86
uWaveGestureLibrary_X	0.71	0.73	0.75	0.77
uWaveGestureLibrary_Y	0.59	0.61	0.66	0.69
uWaveGestureLibrary_Z	0.64	0.70	0.72	0.72
wafer	0.97	0.97	0.98	0.98
WordsSynonyms	0.42	0.44	0.49	0.60
yoga	0.77	0.78	0.79	0.81
NonInvasiveFatalECG_Thorax1	0.85	0.86	0.87	0.89
NonInvasiveFatalECG_Thorax2	0.87	0.91	0.93	0.93

Table 2: Accuracy values for the SR2-CF1 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.

Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	0.60	0.62	0.63	0.66
Adiac	0.55	0.54	0.57	0.61
Beef	0.47	0.53	0.50	0.53
CBF	0.87	0.87	0.87	0.88
ChlorineConcentration	0.56	0.56	0.57	0.64
CinC_ECG_torso	0.65	0.83	0.83	0.80
Coffee	0.46	0.46	0.93	0.93
Cricket_X	0.59	0.60	0.60	0.62
Cricket_Y	0.65	0.65	0.71	0.71
Cricket_Z	0.62	0.64	0.63	0.66
DiatomSizeReduction	0.82	0.84	0.84	0.81
ECG200	0.83	0.83	0.86	0.88
ECGFiveDays	0.62	0.62	0.62	0.67
FaceAll	0.85	0.85	0.87	0.87
FaceFour	0.91	0.89	0.90	0.93
FacesUCR	0.70	0.72	0.74	0.81
fish	0.72	0.79	0.86	0.86
Gun_Point	0.88	0.94	0.93	0.93
Haptics	0.36	0.40	0.43	0.42
InlineSkate	0.27	0.27	0.27	0.27
ItalyPowerDemand	0.72	0.82	0.87	0.90
Lighting2	0.66	0.66	0.66	0.59
Lighting7	0.42	0.52	0.51	0.53
MALLAT	0.67	0.80	0.81	0.91
MedicalImages	0.73	0.74	0.75	0.74
MoteStrain	0.78	0.78	0.79	0.79
OliveOil	0.60	0.63	0.63	0.70
OSULeaf	0.50	0.50	0.50	0.52
SonyAIBORobotSurface	0.81	0.81	0.81	0.81
SonyAIBORobotSurfaceII	0.79	0.79	0.79	0.78
StarLightCurves	0.94	0.95	0.95	0.96
SwedhLeaf	0.77	0.77	0.85	0.86
Symbols	0.66	0.66	0.66	0.77
synthetic_control	0.86	0.93	0.94	0.95
Trace	0.67	0.67	0.81	0.81
TwoLeadECG	0.81	0.83	0.83	0.83
Two_Patterns	0.67	0.76	0.87	0.86
uWaveGestureLibrary_X	0.71	0.73	0.75	0.77
uWaveGestureLibrary_Y	0.59	0.61	0.66	0.69
uWaveGestureLibrary_Z	0.64	0.70	0.72	0.72
wafer	0.97	0.97	0.98	0.98
WordsSynonyms	0.44	0.44	0.48	0.60
yoga	0.74	0.78	0.78	0.81
NonInvasiveFatalECG_Thorax1	0.84	0.86	0.87	0.90
NonInvasiveFatalECG_Thorax2	0.88	0.91	0.93	0.94

Table 3: Accuracy values for the SR2-CF2 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.

Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	0.59	0.63	0.65	0.66
Adiac	0.55	0.54	0.56	0.61
Beef	0.50	0.53	0.50	0.57
CBF	0.87	0.87	0.87	0.87
ChlorineConcentration	0.56	0.56	0.57	0.64
CinC_ECG_torso	0.68	0.77	0.82	0.81
Coffee	0.46	0.50	0.93	0.93
Cricket_X	0.59	0.59	0.60	0.60
Cricket_Y	0.65	0.65	0.71	0.72
Cricket_Z	0.63	0.64	0.63	0.66
DiatomSizeReduction	0.88	0.84	0.84	0.84
ECG200	0.83	0.83	0.86	0.88
ECGFiveDays	0.62	0.62	0.62	0.65
FaceAll	0.84	0.85	0.86	0.87
FaceFour	0.91	0.91	0.92	0.91
FacesUCR	0.70	0.71	0.75	0.81
fish	0.72	0.73	0.86	0.86
Gun_Point	0.89	0.93	0.93	0.93
Haptics	0.39	0.40	0.43	0.48
InlineSkate	0.27	0.28	0.27	0.28
ItalyPowerDemand	0.72	0.83	0.90	0.91
Lighting2	0.66	0.66	0.66	0.59
Lighting7	0.44	0.49	0.52	0.53
MALLAT	0.62	0.80	0.83	0.92
MedicalImages	0.75	0.74	0.75	0.74
MoteStrain	0.78	0.78	0.79	0.79
OliveOil	0.60	0.60	0.63	0.67
OSULeaf	0.46	0.48	0.50	0.52
SonyAIBORobotSurface	0.81	0.81	0.81	0.81
SonyAIBORobotSurfaceII	0.79	0.79	0.79	0.78
StarLightCurves	0.94	0.95	0.95	0.96
SwedhLeaf	0.77	0.77	0.83	0.85
Symbols	0.66	0.66	0.66	0.78
synthetic_control	0.85	0.93	0.94	0.95
Trace	0.68	0.67	0.81	0.81
TwoLeadECG	0.81	0.82	0.83	0.83
Two_Patterns	0.69	0.76	0.87	0.86
uWaveGestureLibrary_X	0.71	0.73	0.75	0.77
uWaveGestureLibrary_Y	0.59	0.61	0.66	0.69
uWaveGestureLibrary_Z	0.64	0.70	0.72	0.72
wafer	0.97	0.97	0.98	0.98
WordsSynonyms	0.42	0.44	0.49	0.60
yoga	0.77	0.78	0.79	0.81
NonInvasiveFatalECG_Thorax1	0.85	0.86	0.87	0.89
NonInvasiveFatalECG_Thorax2	0.87	0.91	0.93	0.93

Table 4: Accuracy values for the SR2-CF3 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.

Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	29.16	33.95	37.02	53.81
Adiac	18.40	18.85	35.84	40.79
Beef	5.00	48.50	57.83	58.83
CBF	26.91	27.03	27.04	27.56
ChlorineConcentration	5.33	5.32	7.71	40.01
CinC_ECG_torso	22.23	44.63	46.17	41.36
Coffee	12.32	11.43	45.89	46.43
Cricket_X	24.10	30.12	30.17	49.65
Cricket_Y	26.88	26.81	29.06	45.31
Cricket_Z	29.21	36.12	37.15	39.26
DiatomSizeReduction	11.75	10.98	10.88	11.03
ECG200	8.10	8.00	10.85	25.50
ECGFiveDays	6.28	6.35	6.34	19.81
FaceAll	24.44	24.35	24.34	39.55
FaceFour	19.83	19.83	20.06	20.57
FacesUCR	25.99	26.67	37.42	37.67
fish	23.03	20.83	36.94	36.97
Gun_Point	24.60	24.43	24.60	24.53
Haptics	6.51	7.39	38.17	38.21
InlineSkate	12.44	12.01	30.49	29.30
ItalyPowerDemand	5.87	23.89	37.11	37.22
Lighting2	5.00	5.00	5.00	5.90
Lighting7	12.88	14.32	13.84	13.84
MALLAT	17.44	17.46	45.13	98.53
MedicalImages	9.51	9.54	14.36	14.35
MoteStrain	7.69	7.66	7.78	7.70
OliveOil	18.83	18.83	18.83	84.17
OSULeaf	8.49	15.33	15.04	40.33
SonyAIBORobotSurface	5.00	5.00	5.00	5.00
SonyAIBORobotSurfaceII	13.01	13.12	12.79	12.97
StarLightCurves	8.19	10.36	11.92	14.62
SwedhLeaf	20.18	19.16	25.42	34.38
Symbols	5.00	5.00	31.79	31.93
synthetic_control	13.50	22.20	21.90	43.55
Trace	5.55	6.10	35.20	35.20
TwoLeadECG	23.80	23.42	23.56	23.71
Two_Patterns	44.92	84.92	89.50	97.44
uWaveGestureLibrary_X	35.27	42.43	46.34	56.26
uWaveGestureLibrary_Y	31.89	33.79	52.44	67.94
uWaveGestureLibrary_Z	31.16	42.82	45.40	55.20
wafer	5.31	5.31	6.38	7.05
WordsSynonyms	13.32	20.95	40.25	56.36
yoga	6.30	10.92	10.87	14.03
NonInvasiveFatalECG_Thorax1	8.81	8.89	14.43	19.18
NonInvasiveFatalECG_Thorax2	6.21	9.75	16.32	25.08

Table 5: Earliness values for the SR1-CF1 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.

Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	29.21	38.98	48.53	58.71
Adiac	20.06	19.99	23.16	46.42
Beef	17.00	33.83	29.33	59.67
CBF	25.04	25.03	25.03	25.06
ChlorineConcentration	5.23	5.24	5.44	33.86
CinC_ECG_torso	30.43	42.26	51.62	54.06
Coffee	13.93	13.39	46.96	48.75
Cricket_X	28.64	28.77	30.62	31.42
Cricket_Y	26.88	25.14	36.41	41.79
Cricket_Z	28.21	27.74	30.96	40.81
DiatomSizeReduction	12.19	10.64	10.75	11.47
ECG200	7.05	7.05	10.85	25.60
ECGFiveDays	6.35	6.36	6.32	18.38
FaceAll	23.33	23.36	25.94	32.12
FaceFour	19.72	20.11	20.23	24.77
FacesUCR	24.58	27.07	30.31	55.65
fish	20.94	21.23	35.37	37.11
Gun_Point	24.53	25.07	24.50	24.57
Haptics	14.77	20.58	31.19	47.27
InlineSkate	17.66	23.81	27.00	27.33
ItalyPowerDemand	6.75	23.87	37.23	37.34
Lighting2	5.00	5.00	5.00	6.07
Lighting7	11.58	16.44	15.75	28.42
MALLAT	15.17	35.17	45.33	84.49
MedicalImages	10.59	10.18	11.18	14.08
MoteStrain	7.59	7.70	8.76	8.58
OliveOil	23.33	23.00	22.00	82.67
OSULeaf	8.82	10.99	12.69	16.74
SonyAIBORobotSurface	5.00	5.00	5.00	5.00
SonyAIBORobotSurfaceII	13.48	12.76	12.83	12.95
StarLightCurves	8.18	10.21	11.73	13.87
SwedhLeaf	17.52	17.71	23.77	30.94
Symbols	5.00	5.00	5.02	33.48
synthetic_control	11.63	19.07	23.05	40.35
Trace	6.40	6.20	34.25	35.20
TwoLeadECG	19.89	24.12	23.59	25.73
Two_Patterns	55.41	70.52	90.58	96.22
uWaveGestureLibrary_X	36.45	38.94	45.50	60.21
uWaveGestureLibrary_Y	30.42	34.97	49.78	65.70
uWaveGestureLibrary_Z	29.63	40.22	48.63	50.65
wafer	5.31	5.31	6.38	7.18
WordsSynonyms	18.17	20.74	31.91	63.58
yoga	8.24	10.91	14.04	23.68
NonInvasiveFatalECG_Thorax1	7.71	9.17	12.80	18.22
NonInvasiveFatalECG_Thorax2	6.02	10.48	17.35	21.10

Table 6: Earliness values for the SR2-CF1 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.

Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	31.11	38.07	41.97	58.71
Adiac	20.90	19.99	23.24	46.42
Beef	8.83	36.67	26.33	57.83
CBF	25.03	25.03	25.05	25.27
ChlorineConcentration	5.23	5.24	5.44	33.86
CinC_ECG_torso	29.48	42.39	42.79	54.22
Coffee	13.93	12.32	46.96	48.04
Cricket_X	28.64	31.47	30.62	43.96
Cricket_Y	25.95	25.68	36.41	39.29
Cricket_Z	27.08	27.74	30.96	40.85
DiatomSizeReduction	11.06	10.42	10.87	10.82
ECG200	7.05	7.05	10.85	25.60
ECGFiveDays	6.29	6.36	6.55	21.77
FaceAll	23.65	23.33	30.90	32.12
FaceFour	20.06	19.60	19.72	23.24
FacesUCR	25.10	26.28	31.34	55.65
fish	20.94	26.91	35.31	36.97
Gun_Point	25.33	25.20	24.53	24.57
Haptics	6.20	19.64	26.07	27.73
InlineSkate	21.36	23.90	27.67	24.98
ItalyPowerDemand	6.70	23.26	32.16	36.91
Lighting2	5.00	5.00	5.00	6.07
Lighting7	7.47	16.44	16.58	27.81
MALLAT	19.00	35.67	43.30	84.94
MedicalImages	9.34	10.07	11.30	11.96
MoteStrain	7.71	7.76	8.72	8.80
OliveOil	18.83	23.17	20.67	84.67
OSULeaf	12.64	13.29	12.73	16.74
SonyAIBORobotSurface	5.00	5.00	5.00	5.00
SonyAIBORobotSurfaceII	13.33	12.85	13.03	13.18
StarLightCurves	8.18	10.17	11.48	13.96
SwedhLeaf	17.00	17.80	27.49	26.66
Symbols	5.00	5.00	5.02	33.28
synthetic_control	12.97	19.07	22.08	40.35
Trace	6.05	6.20	35.20	35.20
TwoLeadECG	19.87	23.78	23.74	24.93
Two_Patterns	55.41	70.52	90.58	96.22
uWaveGestureLibrary_X	36.45	38.94	45.50	59.27
uWaveGestureLibrary_Y	30.42	34.97	49.78	65.70
uWaveGestureLibrary_Z	29.63	40.22	48.63	50.65
wafer	5.31	5.31	6.38	7.10
WordsSynonyms	21.25	20.99	27.49	63.58
yoga	6.30	10.91	10.83	23.69
NonInvasiveFatalECG_Thorax1	7.63	10.03	12.73	21.55
NonInvasiveFatalECG_Thorax2	6.56	10.48	16.45	24.15

Table 7: Earliness values for the SR2-CF2 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.

Dataset	$\alpha = 0.6$	$\alpha = 0.7$	$\alpha = 0.8$	$\alpha = 0.9$
50words	29.21	38.98	48.53	58.71
Adiac	20.06	19.99	23.16	46.42
Beef	17.00	33.83	29.33	59.67
CBF	25.04	25.03	25.03	25.06
ChlorineConcentration	5.23	5.24	5.44	33.85
CinC_ECG_torso	30.43	42.26	51.62	54.06
Coffee	13.93	13.39	46.96	48.75
Cricket_X	28.64	28.77	30.62	31.42
Cricket_Y	26.88	25.14	36.41	41.79
Cricket_Z	28.21	27.74	30.96	40.81
DiatomSizeReduction	12.19	10.64	10.75	11.47
ECG200	7.05	7.05	10.85	25.60
ECGFiveDays	6.35	6.36	6.32	18.38
FaceAll	23.33	23.36	25.94	32.12
FaceFour	19.72	20.11	20.23	24.77
FacesUCR	24.58	27.07	30.31	55.65
fish	20.94	21.23	35.37	37.11
Gun_Point	24.53	25.07	24.50	24.57
Haptics	14.77	20.58	31.19	47.27
InlineSkate	17.66	23.81	27.00	27.33
ItalyPowerDemand	6.75	23.87	37.23	37.34
Lighting2	5.00	5.00	5.00	6.07
Lighting7	11.58	16.44	15.75	28.42
MALLAT	15.17	35.17	45.33	84.49
MedicalImages	10.59	10.18	11.18	14.08
MoteStrain	7.59	7.70	8.76	8.58
OliveOil	23.33	23.00	22.00	82.67
OSULeaf	8.82	10.99	12.69	16.74
SonyAIBORobotSurface	5.00	5.00	5.00	5.00
SonyAIBORobotSurfaceII	13.48	12.76	12.83	12.95
StarLightCurves	8.18	9.96	11.73	13.87
SwedhLeaf	17.52	17.71	23.77	30.94
Symbols	5.00	5.00	5.00	33.48
synthetic_control	11.63	19.07	23.05	40.35
Trace	6.40	6.20	34.25	35.20
TwoLeadECG	19.89	24.12	23.59	25.73
Two_Patterns	59.66	70.52	90.58	96.22
uWaveGestureLibrary_X	36.45	38.94	43.45	60.21
uWaveGestureLibrary_Y	30.42	34.97	49.78	66.25
uWaveGestureLibrary_Z	29.63	40.22	48.63	50.65
wafer	5.31	5.31	6.38	7.18
WordsSynonyms	18.17	20.74	31.91	63.58
yoga	8.24	10.91	14.04	23.68
NonInvasiveFatalECG_Thorax1	7.71	9.17	12.80	18.22
NonInvasiveFatalECG_Thorax2	6.02	10.48	17.35	21.10

Table 8: Earliness values for the SR2-CF3 combination of the method proposed in the paper, for $\alpha \in \{0.6, 0.7, 0.8, 0.9\}$.