REPORT-4

funHDDC with Fourier Basis

Initializer	Threshold	CCR
kmeans	0.001	0.76
	0.01	0.755
	0.05	0.7
	0.1	0.76
	0.2	0.76
	0.3	0.595
	0.4	0.71
random	0.001	0.84
	0.01	0.83
	0.05	0.825
	0.1	0.805
	0.2	0.79
	0.3	0.79
	0.4	0.78

The funHDDC algorithm was run on the ECG data converted into a functional data object using a Fourier basis. The parameters were varied according to the table and the CCR for each configuration was recorded. The best model was chosen automatically using the BIC metric. The highest CCR was obtained with the "**Threshold**" set to **0.01** and the "**Initializer**" set to "**random**". This configuration was able to achieve a **CCR** of **0.84** on the data. The total number of misclassified labels are **32**. This data has a total of **22** outliers from both classes. The number of outliers that are misclassified is **4**.

funHDDC with Bspline Basis

Initializer	Threshold	CCR
kmeans	0.001	0.745
	0.01	0.74
	0.05	0.745
	0.1	0.72
	0.2	0.655
	0.3	0.69
	0.4	0.725
random	0.001	0.71
	0.01	0.705
	0.05	0.73
	0.1	0.71
	0.2	0.635
	0.3	0.735
	0.4	0.54

The funHDDC algorithm was run on the ECG data converted into a functional data object using a Bspline basis. The parameters were varied according to the table and the CCR for each configuration was recorded. The best model was chosen automatically using the BIC metric. The highest CCR was obtained with the "**Threshold**" set to **0.001** or **0.05** and the "**Initializer**" set to "**kmeans**". This configuration was able to achieve a **CCR** of **0.745** on the data. The total number of misclassified labels are **51**. This data has a total of **5** outliers from both classes. The number of outliers that are misclassified is **0**.

tfunHDDC with Fourier Basis

Dconstr	Dfupdate	Initializer	Threshold	CCR
yes	numeric	kmeans	0.001	0.755
			0.01	0.745
			0.05	0.735
			0.1	0.76
			0.2	0.76
			0.3	0.755
			0.4	0.755
		random	0.001	0.795
			0.01	0.795
			0.05	0.795
			0.1	0.855
			0.2	0.77
			0.3	0.8
			0.4	0.785
	approx	kmeans	0.001	0.755
			0.01	0.745
			0.05	0.735
			0.1	0.76
			0.2	0.76
			0.3	0.755
			0.4	0.755
		random	0.001	0.795

tfunHDDC with Fourier Basis

			0.01	0.795
			0.05	0.795
			0.1	0.855
			0.2	0.77
			0.3	0.8
			0.4	0.785
no	numeric	kmeans	0.001	0.755
			0.01	0.75
			0.05	0.725
			0.1	0.76
			0.2	0.76
			0.3	0.755
			0.4	0.755
		random	0.001	0.705
			0.01	0.835
			0.05	0.725
			0.1	0.81
			0.2	0.77
			0.3	0.8
			0.4	0.785
	approx	kmeans	0.001	0.755
			0.01	0.75
			0.05	0.735
			0.1	0.755
			0.2	0.76

			0.3	0.755
			0.4	0.755
		random	0.001	0.7
			0.01	0.75
			0.05	0.735
			0.1	0.735
			0.2	0.77
			0.3	0.79
			0.4	0.76

The tfunHDDC algorithm was run on the ECG data converted into a functional data object using a Fourier basis. The parameters were varied according to the table and the CCR for each configuration was recorded. The best model was chosen automatically using the BIC metric. The highest CCR was obtained with the "**Threshold**" set to **0.1**, the "Initializer" set to "**random**", the "**Dfupdate**" set to "**approx**" or "**numeric**" and the "**Dconstr**" set to "**yes**". This configuration was able to achieve a CCR of 0.855 on the data. The total number of misclassified labels are **29**. This data has a total of **22** outliers from both classes. The number of outliers that are misclassified is **0**.

tfunHDDC with Bspline Basis

Dconstr	Dfupdate	Initializer	Threshold	CCR
yes	numeric	kmeans	0.001	0.75
			0.01	0.55
			0.05	0.72
			0.1	0.765
			0.2	0.765
			0.3	0.765
			0.4	0.765
		random	0.001	<mark>0.785</mark>
			0.01	0.745
			0.05	0.69
			0.1	0.765
			0.2	0.765
			0.3	0.765
			0.4	0.765
	approx	kmeans	0.001	0.75
			0.01	0.55
			0.05	0.72
			0.1	0.765
			0.2	0.765
			0.3	0.765
			0.4	0.765
		random	0.001	<mark>0.785</mark>
			0.01	0.745

tfunHDDC with Bspline Basis

			0.05	0.69
			0.1	0.765
			0.2	0.765
			0.3	0.765
			0.4	0.765
no	numeric	kmeans	0.001	0.75
			0.01	0.55
			0.05	0.735
			0.1	0.765
			0.2	0.765
			0.3	0.765
			0.4	0.765
		random	0.001	0.785
			0.01	0.745
			0.05	0.69
			0.1	0.765
			0.2	0.765
			0.3	0.765
			0.4	0.765
	approx	kmeans	0.001	0.75
			0.01	0.55
			0.05	0.765
			0.1	0.765
			0.2	0.765
			0.3	0.765

			0.4	0.765
			0.001	==0.785==
			0.01	0.745
			0.05	0.69
		random	0.1	0.765
			0.2	0.765
			0.3	0.765
			0.4	0.765

The tfunHDDC algorithm was run on the ECG data converted into a functional data object using a Bspline basis. The parameters were varied according to the table and the CCR for each configuration was recorded. The best model was chosen automatically using the BIC metric. The highest CCR was obtained with various configurations. One interesting fact is that no matter the values of the "**Dfupdate**" and "**Dconstr**" parameters, if the "**Initializer**" is set to "**random**" and the "**Threshold**" is set to **0.001** the model is able to achieve the highest CCR. These are highlighted in the table above. These configurations were able to achieve a **CCR** of **0.785** on the data. The total number of misclassified labels are **43**. This data has a total of **5** outliers from both classes. The number of outliers that are misclassified is **0**.

cfunHDDC with Fourier Basis

Initializer	Threshold	Alphamin	Eta1	Eta2	CCR
kmeans	0.001	0.5	4.851801	12.54592	0.76
		0.6	4.851801	12.54592	0.76
		0.7	4.881624	12.56158	0.76
		0.8	5.192161	12.9742	0.76
		0.85	5.634242	12.22906	0.76
		0.9	5.775491	12.1989	0.76
		0.95	7.390356	12.47509	0.755
	0.01	0.5	4.916504	12.98552	0.745
		0.6	4.916504	12.98552	0.745
		0.7	4.941505	13.02134	0.745
		0.8	5.099383	13.04572	0.745
		0.85	5.117947	12.64636	0.745
		0.9	6.287614	11.33169	0.75
		0.95	5.20952	13.98913	0.765
	0.05	0.5	3.660024	15.92869	0.74
		0.6	3.714448	15.7564	0.74
		0.7	3.807025	15.36336	0.74
		0.8	4.336278	14.6707	0.745
		0.85	4.698932	14.18823	0.735
		0.9	4.896812	13.49985	0.735
		0.95	12.96076	14.18095	0.75
	0.1	0.5	13.83218	4.715653	0.735

		0.6	13.77458	4.755339	0.735
		0.7	13.73522	4.932894	0.725
		0.8	9.991508	14.6662	0.745
		0.85	9.959099	14.62584	0.745
		0.9	9.880587	14.43394	0.745
		0.95	14.60717	3.738225	0.735
	0.2	0.5	12.09131	5.371083	0.755
		0.6	12.10309	5.376286	0.755
		0.7	12.14522	5.319775	0.755
		0.8	12.09836	4.748381	0.755
		0.85	4.780299	13.42369	0.75
		0.9	4.10241	19.68735	0.76
		0.95	4.615807	19.27739	0.765
	0.3	0.5	5.417174	21.87661	0.74
		0.6	4.373444	24.07831	0.735
		0.7	4.403296	23.9974	0.735
		0.8	4.392968	23.83858	0.74
		0.85	3.829425	23.60799	0.74
		0.9	4.80912	22.14721	0.75
		0.95	5.93394	3.494555	0.55
	0.4	0.5	5.417174	21.87661	0.74
		0.6	4.373444	24.07831	0.735
		0.7	4.403296	23.9974	0.735
		0.8	4.392968	23.83858	0.74
		0.85	3.829425	23.60799	0.74

		0.9	4.80912	22.14721	0.75
		0.95	9.864785	5.109795	0.75
random	0.001	0.5	7.340147	8.721371	0.77
		0.6	7.340147	8.721371	0.77
		0.7	7.360263	8.758391	0.77
		0.8	8.944482	7.134026	0.78
		0.85	5.628841	6.529131	0.79
		0.9	7.463936	4.749399	0.795
		0.95	4.902774	7.874592	0.795
	0.01	0.5	8.915587	6.530792	0.77
		0.6	5.981619	9.654887	0.765
		0.7	7.085553	7.762559	==0.84==
		0.8	7.076365	7.861789	==0.84==
		0.85	7.059114	7.93761	==0.84==
		0.9	7.092878	8.034011	0.835
		0.95	6.553035	6.591264	0.795
	0.05	0.5	9.821098	6.041657	0.775
		0.6	9.820287	6.045162	0.775
		0.7	9.803387	6.197766	0.77
		0.8	10.99151	4.193703	0.79
		0.85	10.94827	4.229101	0.79
		0.9	72.10354	2.316662	0.765
		0.95	3.489963	31.59507	0.745
	0.1	0.5	2.941184	151.8979	0.77
		0.6	2.755144	151.9469	0.77

		0.7	2.641318	152.7392	0.77
		0.8	2.605505	154.0694	0.775
		0.85	2.569878	154.3025	0.775
		0.9	2.688531	155.0571	0.775
		0.95	10.40805	49.47463	0.805
	0.2	0.5	15.09518	6.592133	0.72
		0.6	14.96766	6.472133	0.72
		0.7	3.668319	13.75549	0.745
		0.8	13.87498	3.839593	0.71
		0.85	2.994477	13.73651	0.77
		0.9	14.22036	3.03651	0.765
		0.95	8.767399	7.056145	0.785
	0.3	0.5	13.9963	3.80061	0.745
		0.6	13.86783	3.733776	0.745
		0.7	13.75549	3.668306	0.745
		0.8	13.00803	3.010589	0.785
		0.85	13.73653	2.994478	0.77
		0.9	14.22041	3.036501	0.765
		0.95	7.056141	8.767435	0.785
	0.4	0.5	7.261258	6.068487	0.785
		0.6	7.275038	6.075912	0.785
		0.7	7.31652	6.065175	0.785
		0.8	7.339745	5.971047	0.785
		0.85	6.244864	6.961841	0.825
		0.9	6.280434	6.949104	0.815

		0.95	6.304806	7.143745	0.8

The cfunHDDC algorithm was run on the ECG data converted into a functional data object using a Fourier basis. The parameters were varied according to the table and the CCR for each configuration was recorded. The best model was chosen automatically using the BIC metric. The highest CCR was obtained with the "**Threshold**" set to **0.01**, the "**Initializer**" set to "**random**", the "**Alphamin**" set to **0.7**, **0.8** or **0.85**. This configuration was able to achieve a **CCR** of **0.84** on the data. The total number of misclassified labels are **32**. This data has a total of **22** outliers from both classes. The number of outliers that are misclassified is **4**.