REPORT-6

cfunHDDC with Bspline Basis (20 splines)

Initializer	Threshold	Alphamin	Eta1	Eta2	CCR	Class 1 Outliers	Class 2 Outliers
kmeans	0.001	0.5	999.9999	999.9999	0.745	67/67	133/133
		0.6	999.9999	999.9999	0.745	67/67	133/133
		0.7	999.9999	999.9999	0.745	67/67	133/133
		0.8	999.9999	999.9999	0.745	67/67	133/133
		0.85	999.9999	999.9999	0.745	67/67	133/133
		0.9	999.9999	999.9999	0.745	67/67	133/133
		0.95	999.9999	999.9999	0.745	67/67	133/133
	0.01	0.5	999.9999	999.9999	0.740	67/67	133/133
		0.6	999.9999	999.9999	0.740	67/67	133/133
		0.7	999.9999	999.9999	0.740	67/67	133/133
		0.8	999.9999	999.9999	0.740	67/67	133/133
		0.85	999.9999	999.9999	0.740	67/67	133/133
		0.9	999.9999	999.9999	0.740	67/67	133/133
		0.95	999.9999	999.9999	0.740	67/67	133/133
	0.05	0.5	999.9999	999.9999	0.730	67/67	133/133
		0.6	999.9999	999.9999	0.730	67/67	133/133
		0.7	999.9999	999.9999	0.730	67/67	133/133
		0.8	999.9999	999.9999	0.730	67/67	133/133
		0.85	999.9999	999.9999	0.730	67/67	133/133
		0.9	999.9999	999.9999	0.730	67/67	133/133
		0.95	999.9999	999.9999	0.730	67/67	133/133

	0.1	0.5	999.9999	999.9999	0.760	67/67	133/133
		0.6	999.9999	999.9999	0.710	67/67	133/133
		0.7	999.9999	999.9999	0.755	67/67	133/133
		0.8	999.9999	999.9999	0.755	67/67	133/133
		0.85	999.9999	999.9999	0.760	67/67	133/133
		0.9	999.9999	999.9999	0.760	67/67	133/133
		0.95	999.9999	999.9999	0.725	67/67	133/133
	0.2	0.5	999.9999	999.9999	0.730	67/67	133/133
		0.6	999.9999	999.9999	0.730	67/67	133/133
		0.7	999.9999	999.9999	0.655	67/67	133/133
		0.8	999.9999	999.9999	0.730	67/67	133/133
		0.85	999.9999	999.9999	0.730	67/67	133/133
		0.9	999.9999	999.9999	0.730	67/67	133/133
		0.95	999.9999	999.9999	0.730	67/67	133/133
	0.3	0.5	999.9999	999.9999	0.685	67/67	133/133
		0.6	999.9999	999.9999	0.685	67/67	133/133
		0.7	999.9999	999.9999	0.735	67/67	133/133
		0.8	999.9999	999.9999	0.625	67/67	133/133
		0.85	999.9999	999.9999	0.690	67/67	133/133
		0.9	999.9999	999.9999	0.705	67/67	133/133
		0.95	999.9999	999.9999	0.745	67/67	133/133
	0.4	0.5	999.9999	999.9999	0.760	67/67	133/133
		0.6	999.9999	999.9999	0.755	67/67	133/133
		0.7	999.9999	999.9999	0.715	67/67	133/133
		0.8	999.9999	999.9999	0.540	67/67	133/133

		0.85	999.9999	999.9999	0.540	67/67	133/133
		0.9	999.9999	999.9999	0.540	67/67	133/133
		0.95	999.9999	999.9999	0.540	67/67	133/133
random	0.001	0.5	999.9999	999.9999	0.710	67/67	133/133
		0.6	999.9999	999.9999	0.710	67/67	133/133
		0.7	999.9999	999.9999	0.710	67/67	133/133
		0.8	999.9999	999.9999	0.710	67/67	133/133
		0.85	999.9999	999.9999	0.710	67/67	133/133
		0.9	999.9999	999.9999	0.710	67/67	133/133
		0.95	999.9999	999.9999	0.710	67/67	133/133
	0.01	0.5	999.9999	999.9999	0.705	67/67	133/133
		0.6	999.9999	999.9999	0.705	67/67	133/133
		0.7	999.9999	999.9999	0.705	67/67	133/133
		0.8	999.9999	999.9999	0.705	67/67	133/133
		0.85	999.9999	999.9999	0.705	67/67	133/133
		0.9	999.9999	999.9999	0.705	67/67	133/133
		0.95	999.9999	999.9999	0.705	67/67	133/133
	0.05	0.5	999.9999	999.9999	0.730	67/67	133/133
		0.6	999.9999	999.9999	0.730	67/67	133/133
		0.7	999.9999	999.9999	0.730	67/67	133/133
		0.8	999.9999	999.9999	0.730	67/67	133/133
		0.85	999.9999	999.9999	0.730	67/67	133/133
		0.9	999.9999	999.9999	0.730	67/67	133/133
		0.95	999.9999	999.9999	0.730	67/67	133/133
	0.1	0.5	999.9999	999.9999	0.610	67/67	133/133

		0.6	999.9999	999.9999	0.610	67/67	133/133
		0.7	999.9999	999.9999	0.725	67/67	133/133
		0.8	999.9999	999.9999	0.610	67/67	133/133
		0.85	999.9999	999.9999	0.725	67/67	133/133
		0.9	999.9999	999.9999	0.610	67/67	133/133
		0.95	999.9999	999.9999	0.610	67/67	133/133
	0.2	0.5	999.9999	999.9999	0.635	67/67	133/133
		0.6	999.9999	999.9999	0.635	67/67	133/133
		0.7	999.9999	999.9999	0.635	67/67	133/133
		0.8	999.9999	999.9999	0.635	67/67	133/133
		0.85	999.9999	999.9999	0.635	67/67	133/133
		0.9	999.9999	999.9999	0.635	67/67	133/133
		0.95	999.9999	999.9999	0.635	67/67	133/133
	0.3	0.5	999.9999	999.9999	0.690	67/67	133/133
		0.6	999.9999	999.9999	0.700	67/67	133/133
		0.7	999.9999	999.9999	0.705	67/67	133/133
		0.8	999.9999	999.9999	0.735	67/67	133/133
		0.85	999.9999	999.9999	0.540	67/67	133/133
		0.9	999.9999	999.9999	0.540	67/67	133/133
		0.95	999.9999	999.9999	0.685	67/67	133/133
	0.4	0.5	999.9999	999.9999	0.540	67/67	133/133
		0.6	999.9999	999.9999	0.705	67/67	133/133
		0.7	999.9999	999.9999	0.675	67/67	133/133
		0.8	999.9999	999.9999	0.695	67/67	133/133
		0.85	999.9999	999.9999	0.725	67/67	133/133

		0.9	999.9999	999.9999	0.705	67/67	133/133
		0.95	999.9999	999.9999	0.540	67/67	133/133

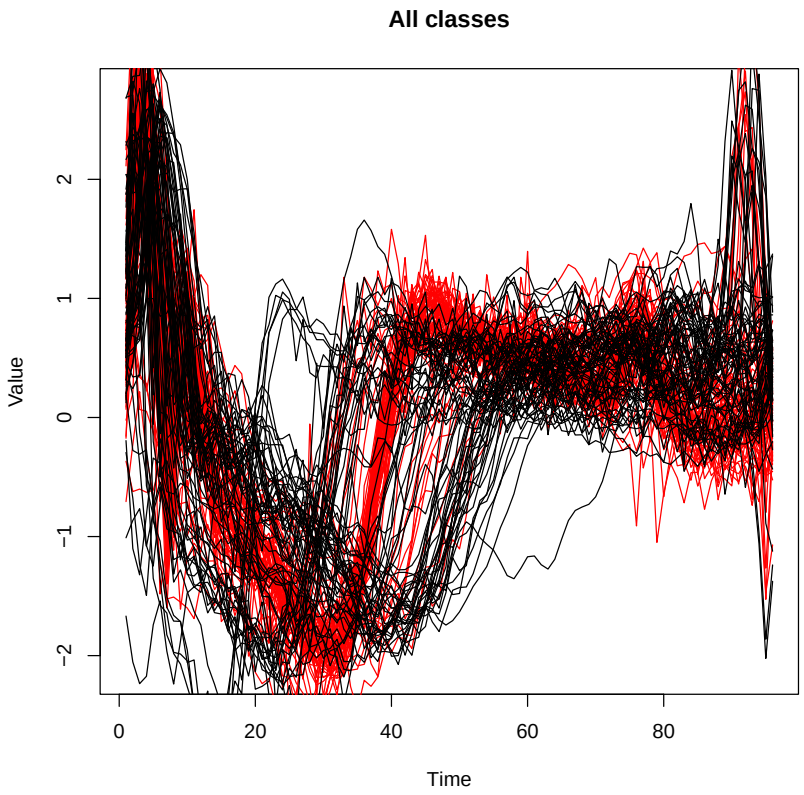
The cfunHDDC algorithm was run on the ECG data converted into a functional data object using a Bspline basis with 20 splines. The parameters were varied according to the table and the CCR for each configuration was recorded. The best model was chosen automatically using the BIC metric. The highest CCR was obtained with various configurations. They are:

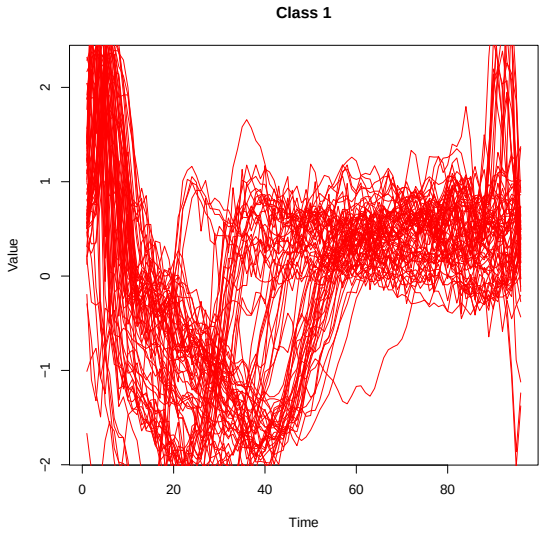
1. "**Threshold**" set to **0.1**, the "**Initializer**" set to "**kmeans**", the "**Alphamin**" set to **0.5**, **0.85** or **0.9**.

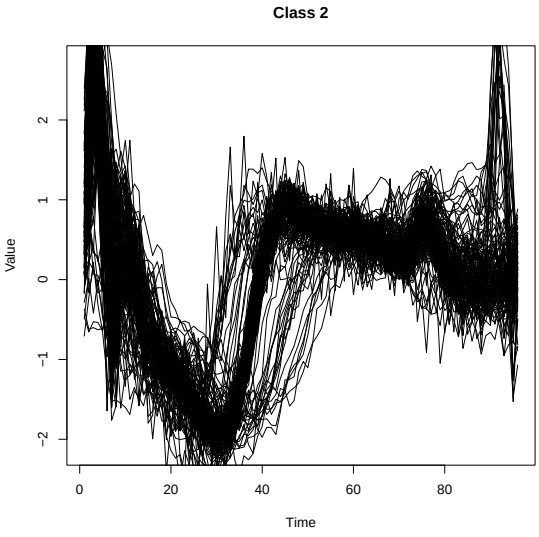
2. "**Threshold**" set to **0.4**, the "**Initializer**" set to "**kmeans**", the "**Alphamin**" set to **0.5**.

These configurations was able to achieve a **CCR** of 0.76 on the data. The total number of misclassified labels are **48**. This data has a total of **5** outliers from both classes. The number of outliers that are misclassified is **1**.

Original Data



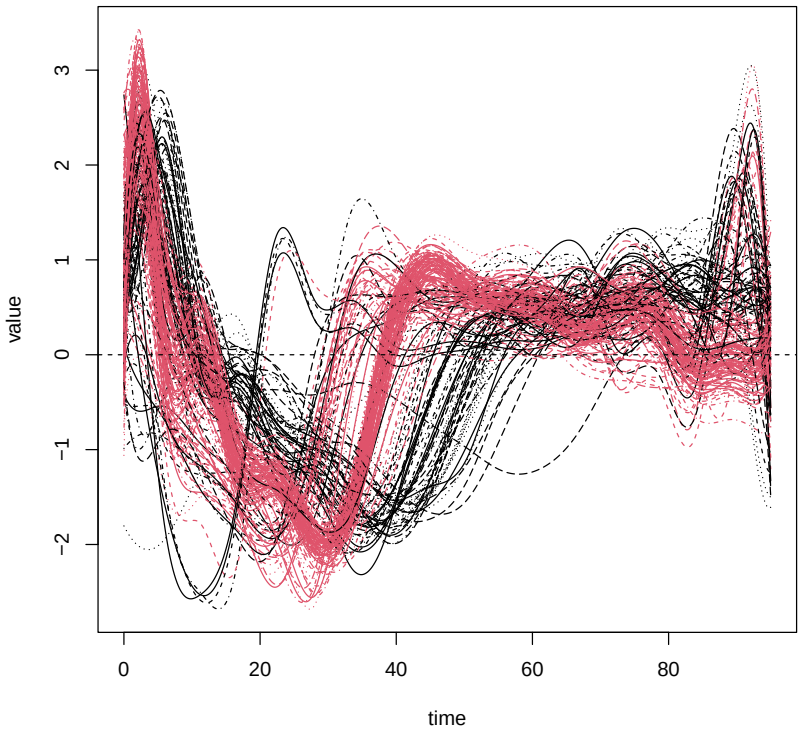




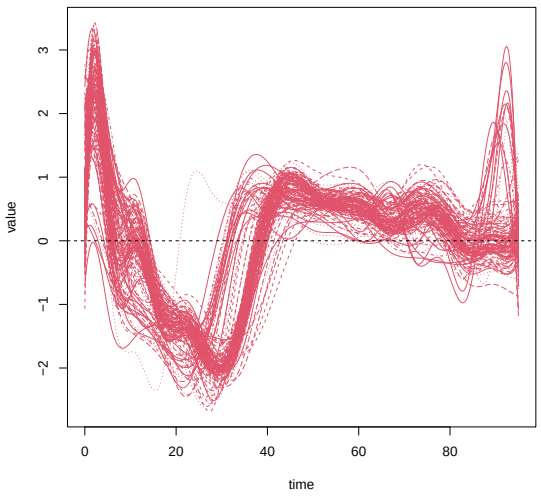
Best Bspline tfunHDDC Cluster (0.785 CCR)

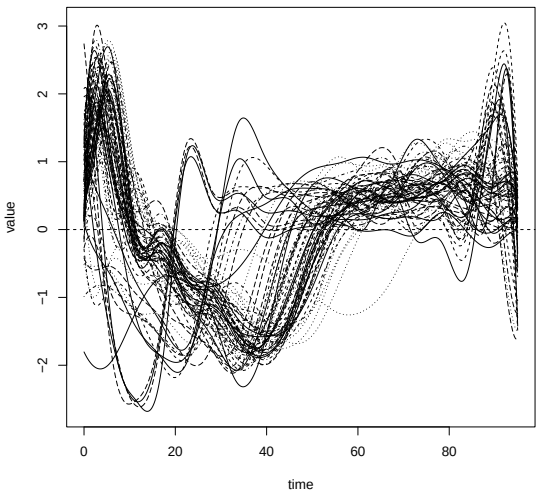
init = random; threshold = 0.001; dfupdate = numeric; dconstr = yes

All Classes



Class 1 and Class 2

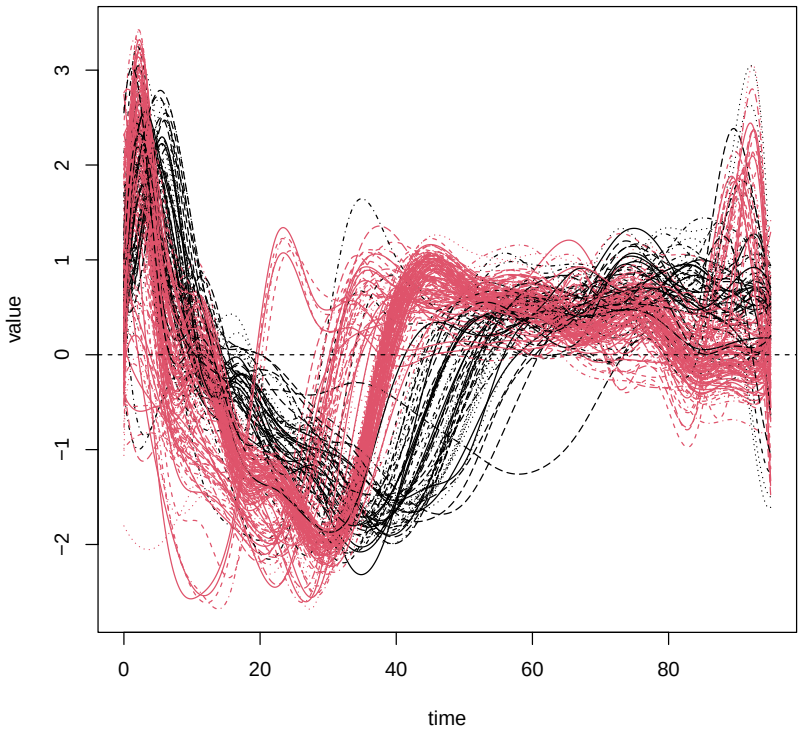




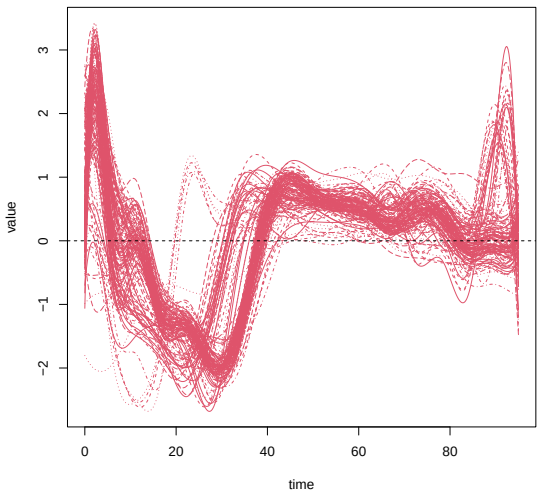
Best Bspline cfunHDDC cluster (0.76 CCR)

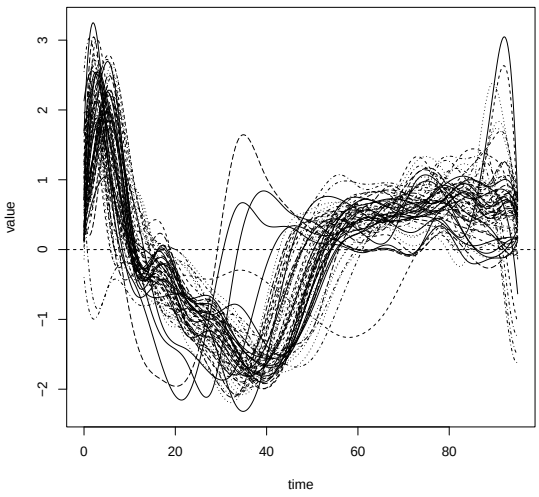
init = kmeans; threshold = 0.1; alphamin = 0.85

All Classes



Class 1 and Class 2

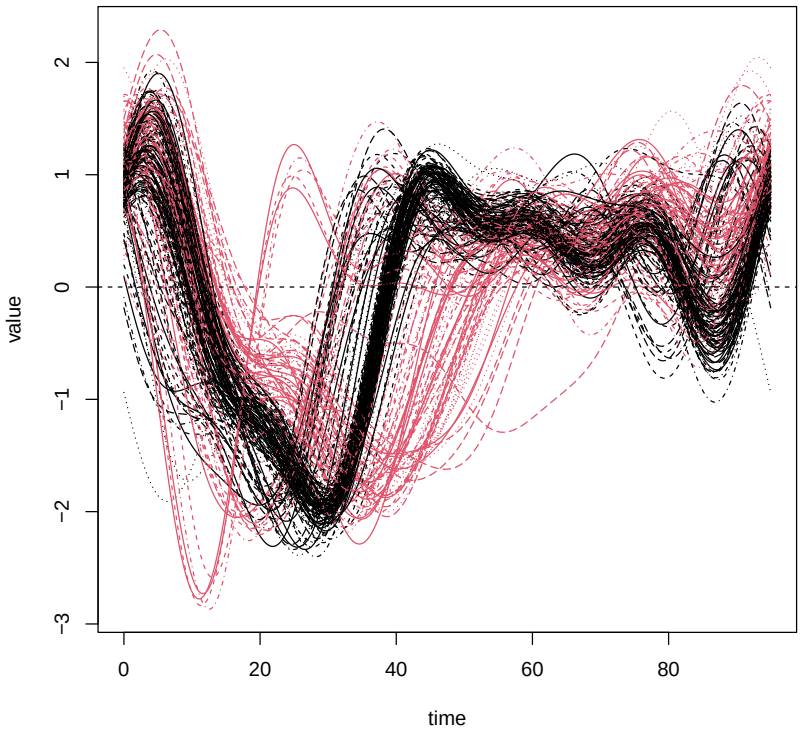




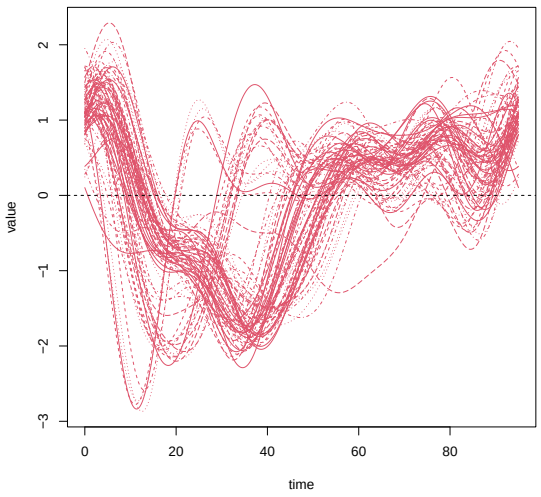
Best Fourier tfunHDDC Cluster (0.855 CCR)

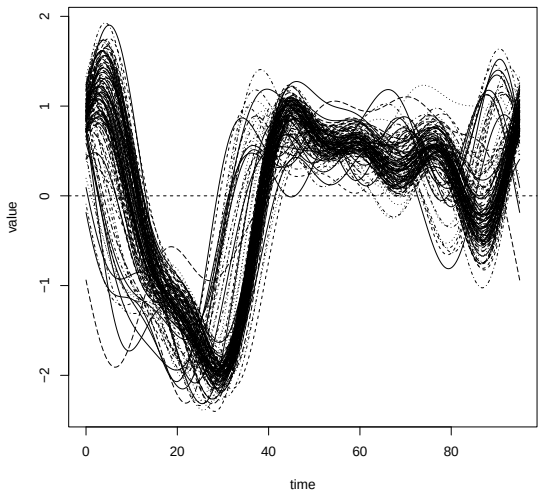
init = random; threshold = 0.01; dfupdate = numeric; dconstr = yes

All Classes



Class 1 and Class 2

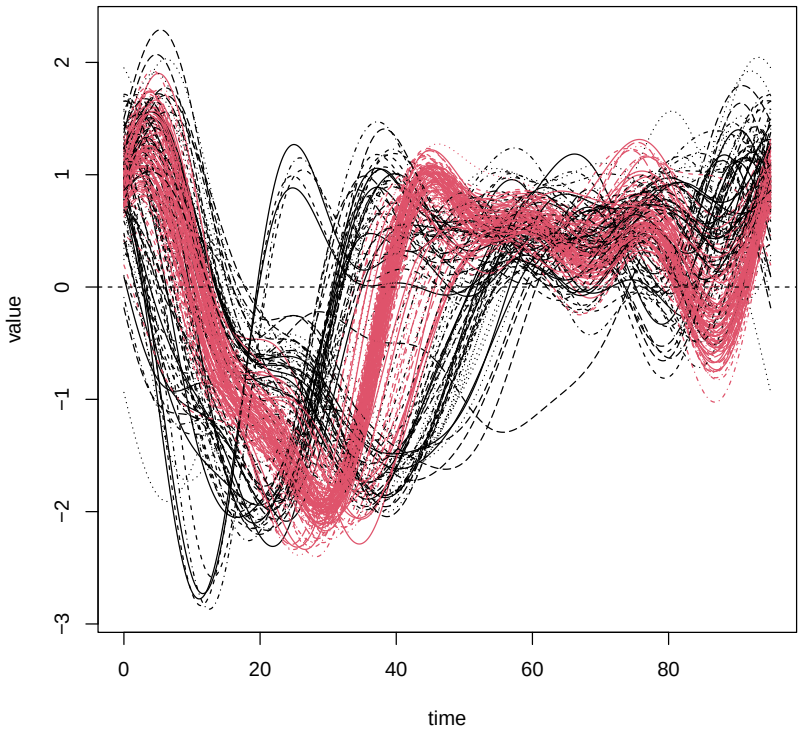




Best Fourier cfunHDDC cluster (0.84 CCR)

init = random; threshold = 0.01; alphamin = 0.8

All Classes



Class 1 and Class 2