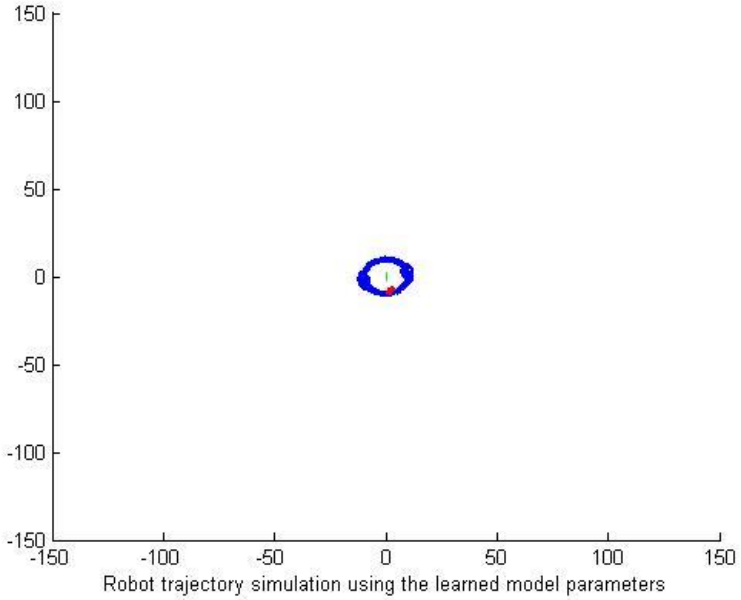
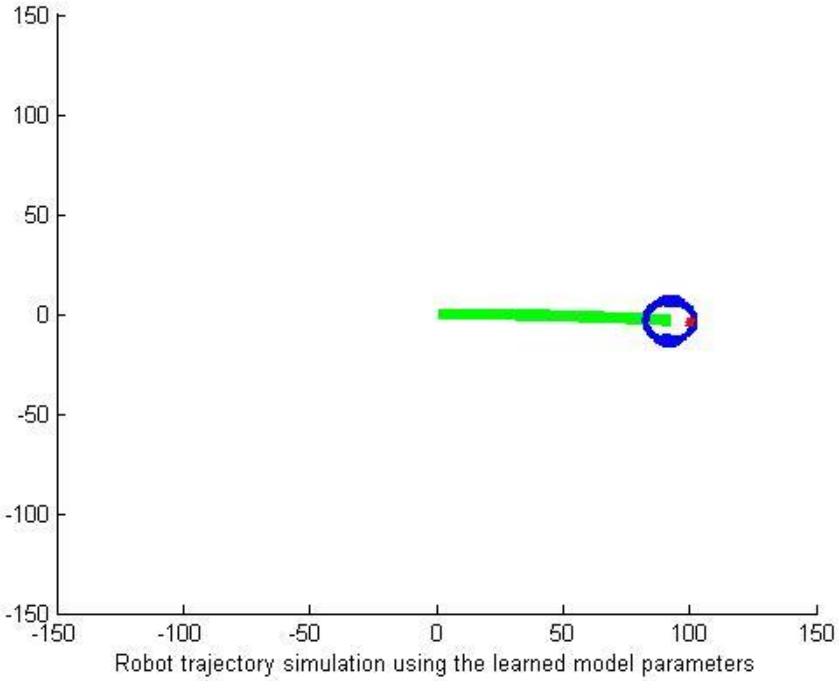
Exercise 1

1) K = 2
   P1 = 5, P2 = 3

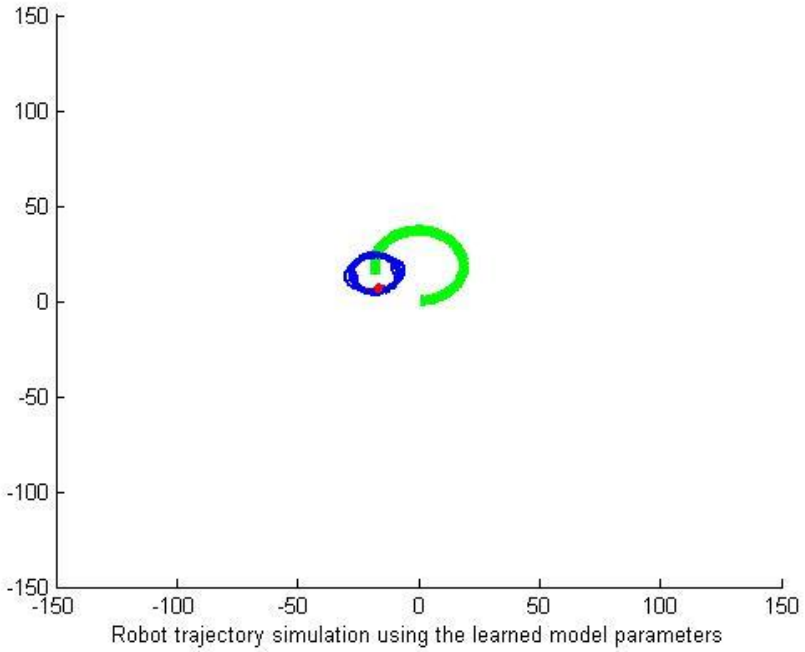
The resulting plots are as follows:



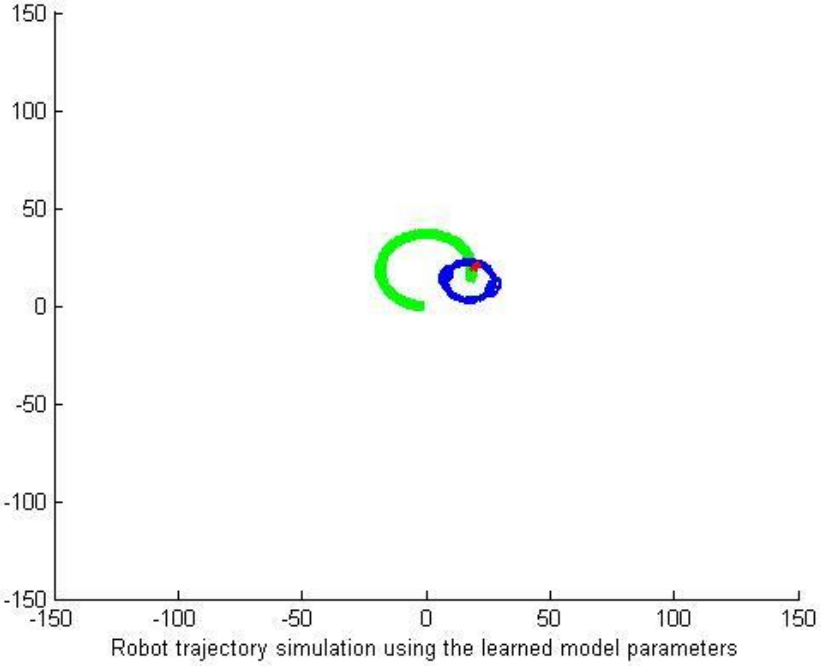
$(v, \omega) = (0,0.05)$



$(v, \omega) = (1,0)$



$(v, \omega) = (1, 0.05)$

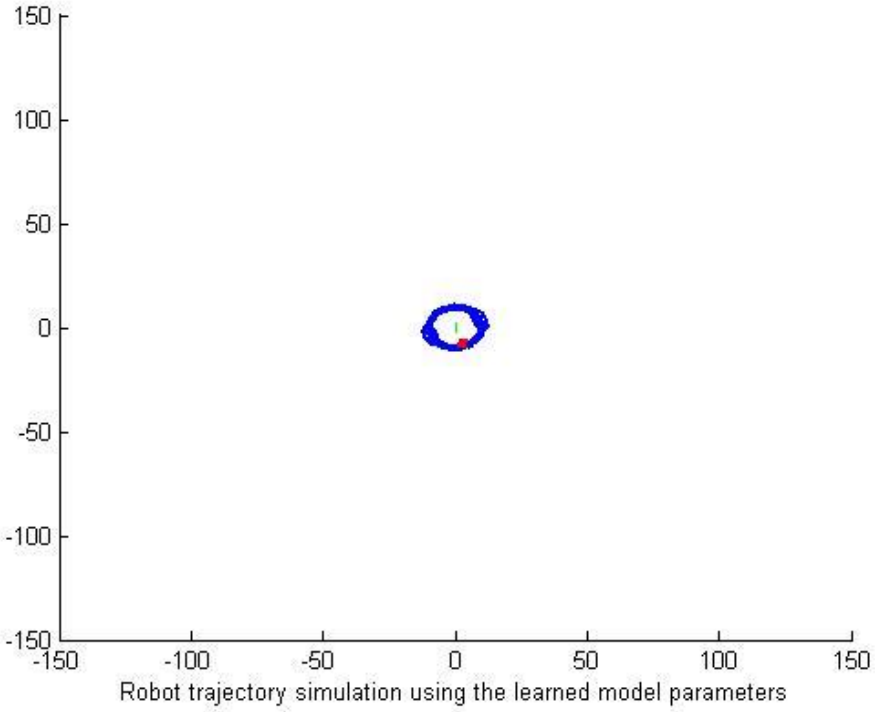


$(v, \omega) = (-1, -0.05)$

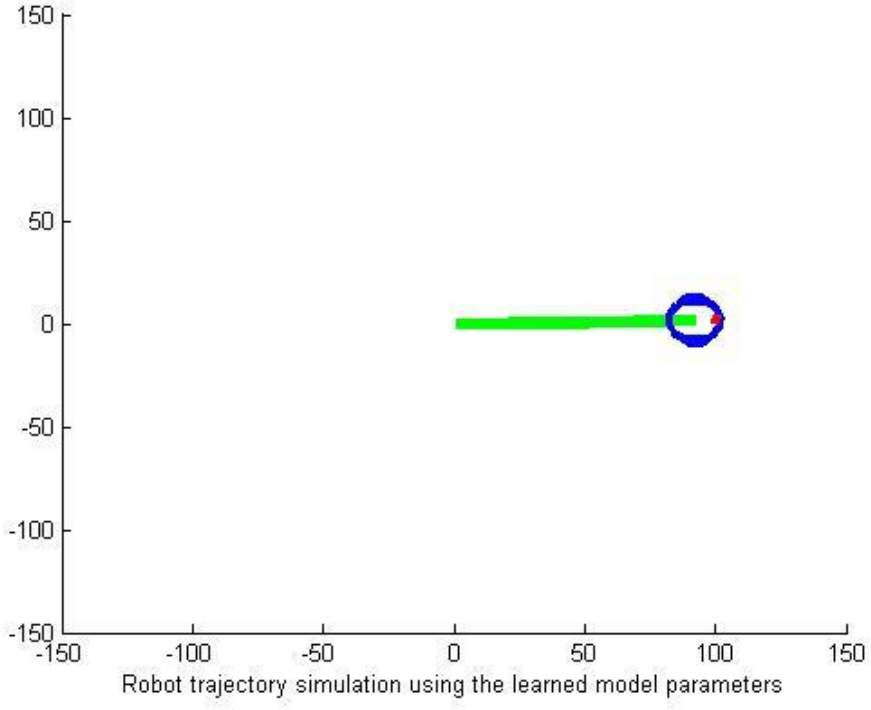
2) K = 5

P1 = 4, P2 = 1

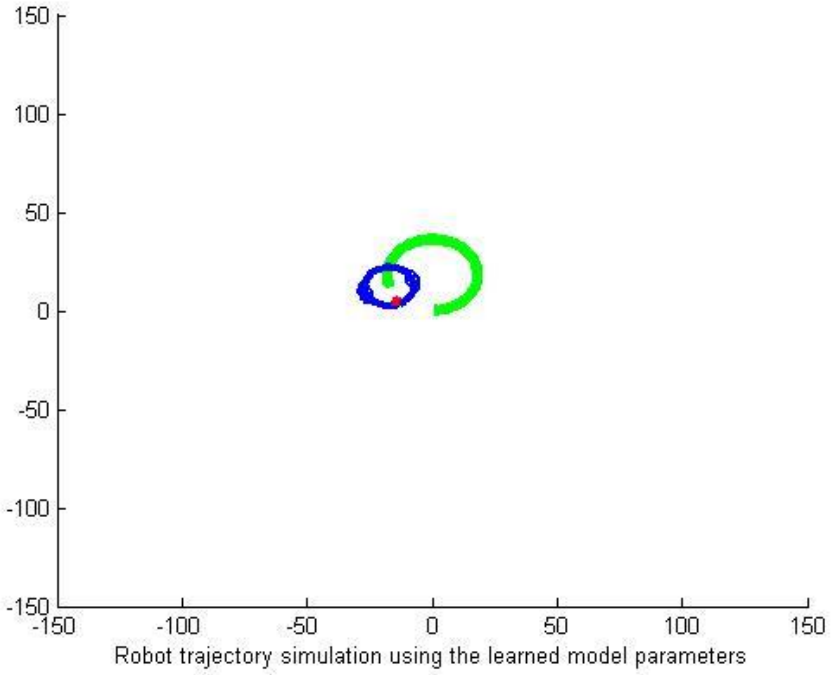
The resulting plots are as follows:



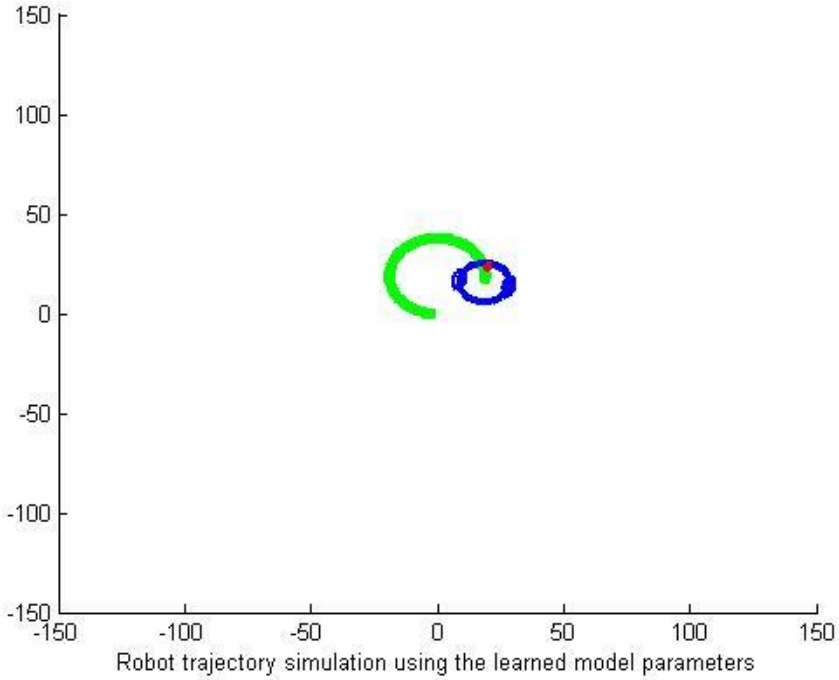
$(v, \omega) = (0,0.05)$



$(v, \omega) = (1,0)$



$(v, \omega) = (1, 0.05)$

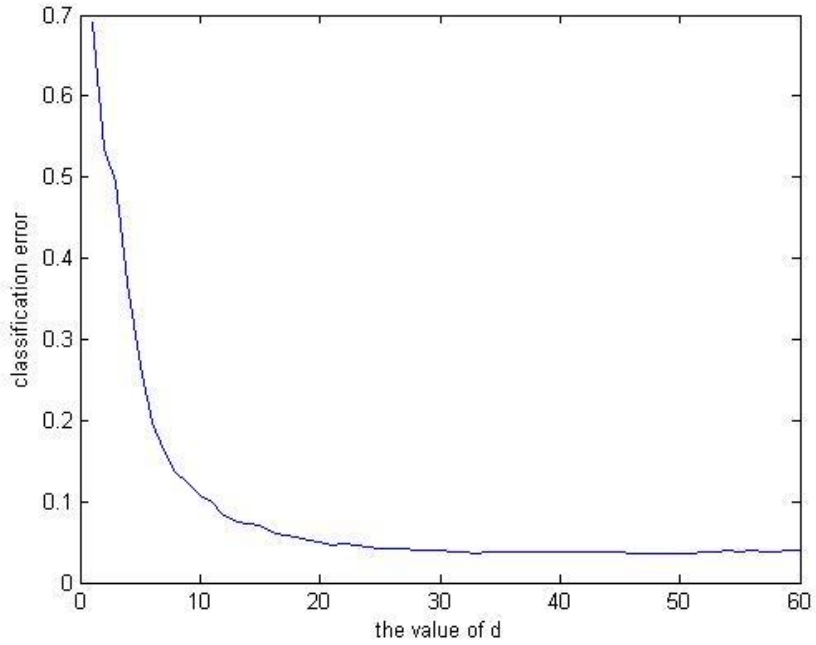


$(v, \omega) = (-1, -0.05)$

Exercise 2

The optimal value of **d is 48**. The minimal **classification error is 0.0362**. The **confusion matrix** is as follows:

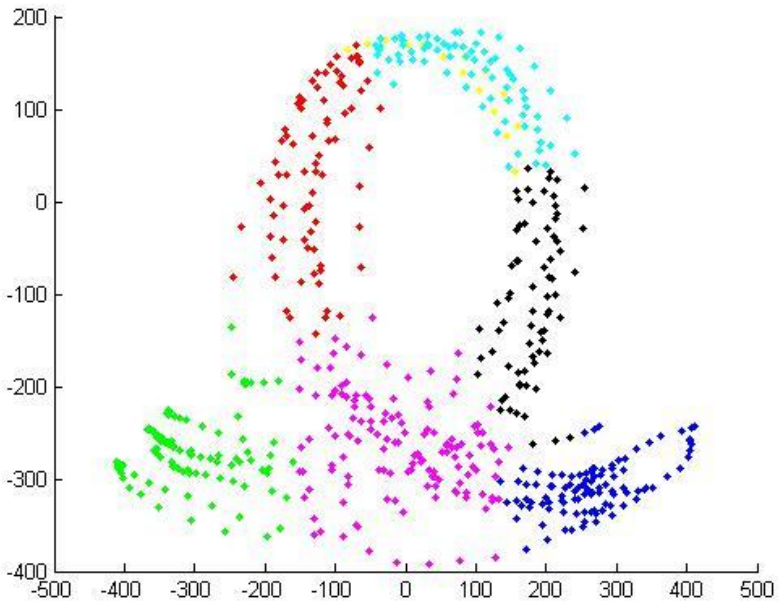
970	0	1	0	0	2	1	1	5	0
0	1098	11	1	2	1	1	0	21	0
3	0	1001	3	3	0	2	1	18	1
2	0	8	972	0	5	0	2	17	4
1	0	3	0	964	0	3	2	3	6
2	0	1	18	0	859	2	0	10	0
8	1	1	0	3	13	924	0	8	0
1	2	31	1	2	3	0	956	13	19
3	0	7	10	1	5	1	1	941	5
5	1	10	7	10	2	0	6	15	953



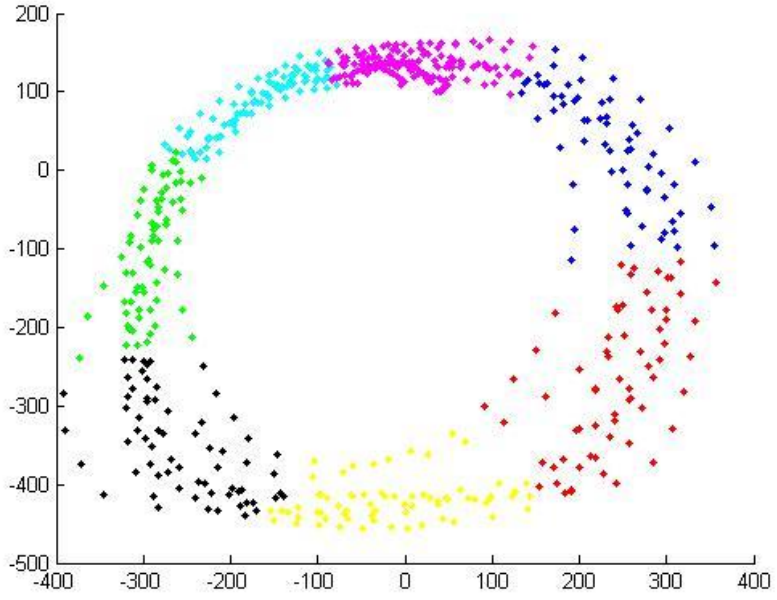
Classification errors

Exercise 3

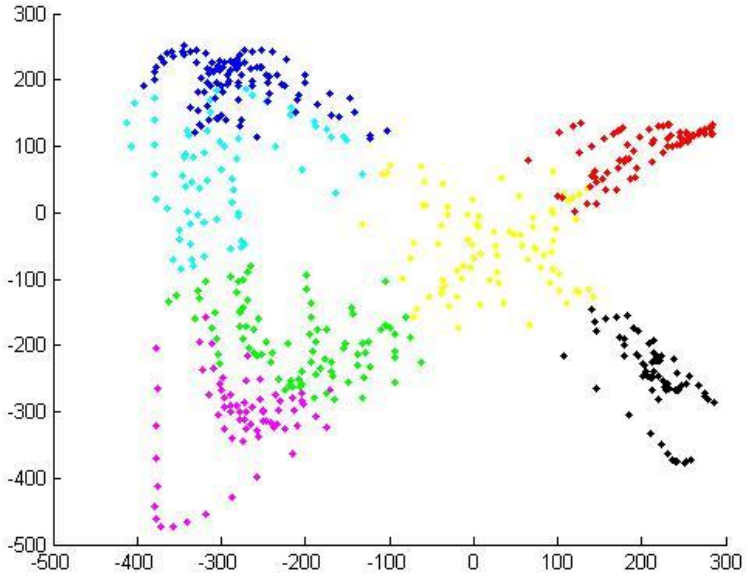
1) K-Means



Gesture_l

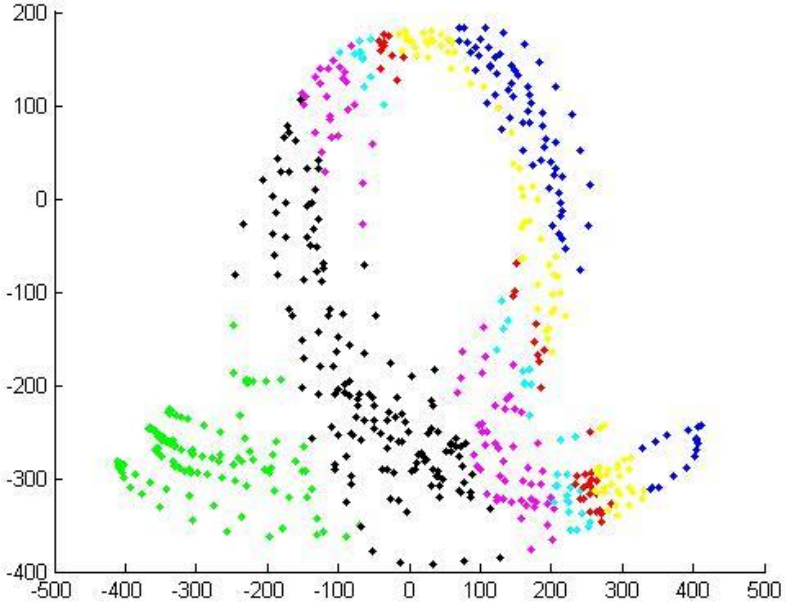


Gesture_o

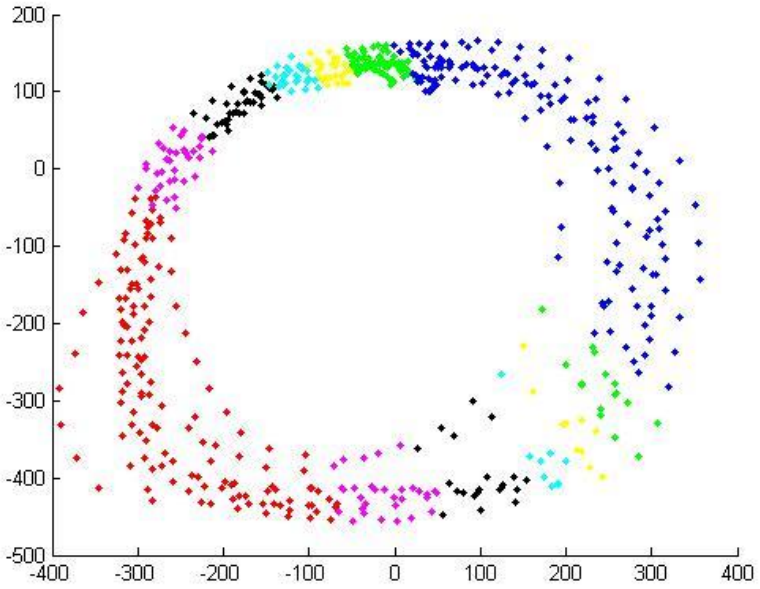


Gesture_x

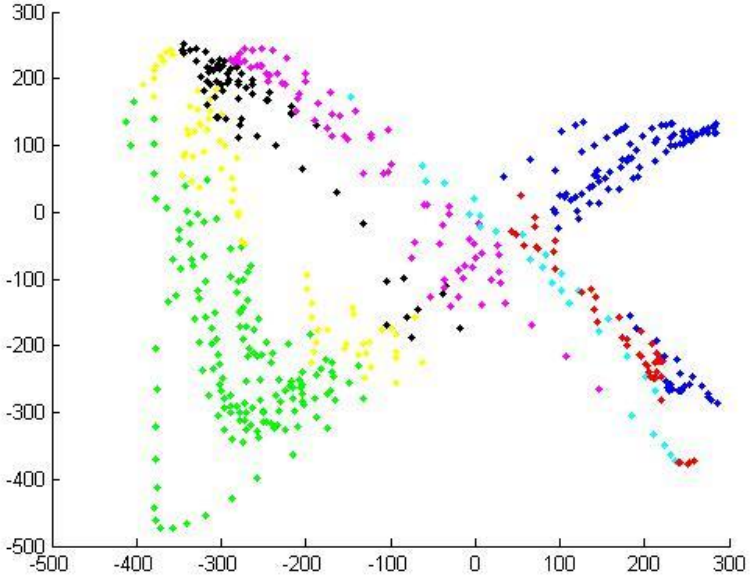
2) Nub



Gesture_l



Gesture_o



Gesture_x