

Article

sEMG-Based Hand Posture Recognition Considering Electrode Shift, Feature Vectors, and Posture Groups

Jongman Kim, Bummo Koo, Yejin Nam and Youngho Kim *

Department of Biomedical Engineering, Yonsei University, Wonju 26493, Korea; jmkim0127@ybri.yonsei.ac.kr (J.K.); bmk726@ybri.yonsei.ac.kr (B.K.); namyj_1007@naver.com (Y.N.)

* Correspondence: younghokim@yonsei.ac.kr; Tel.: +82-33-760-2859

Supplementary Materials:

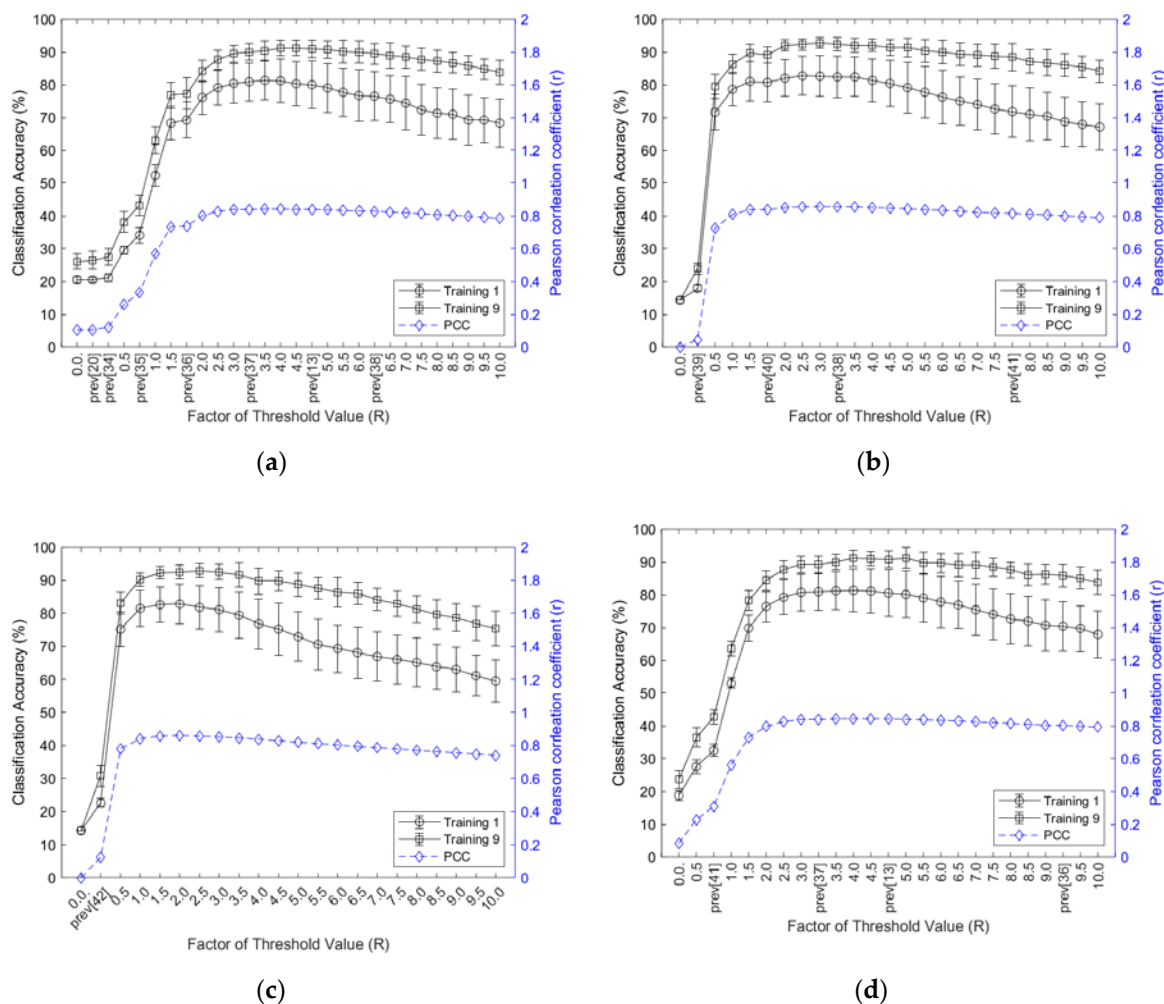


Figure S1. Classification accuracy and inter-session PCC of Group 2 by threshold values: (a) ZC; (b) WAMP; (c) MYOP; (d) SSC; prev: threshold value from the previous study.

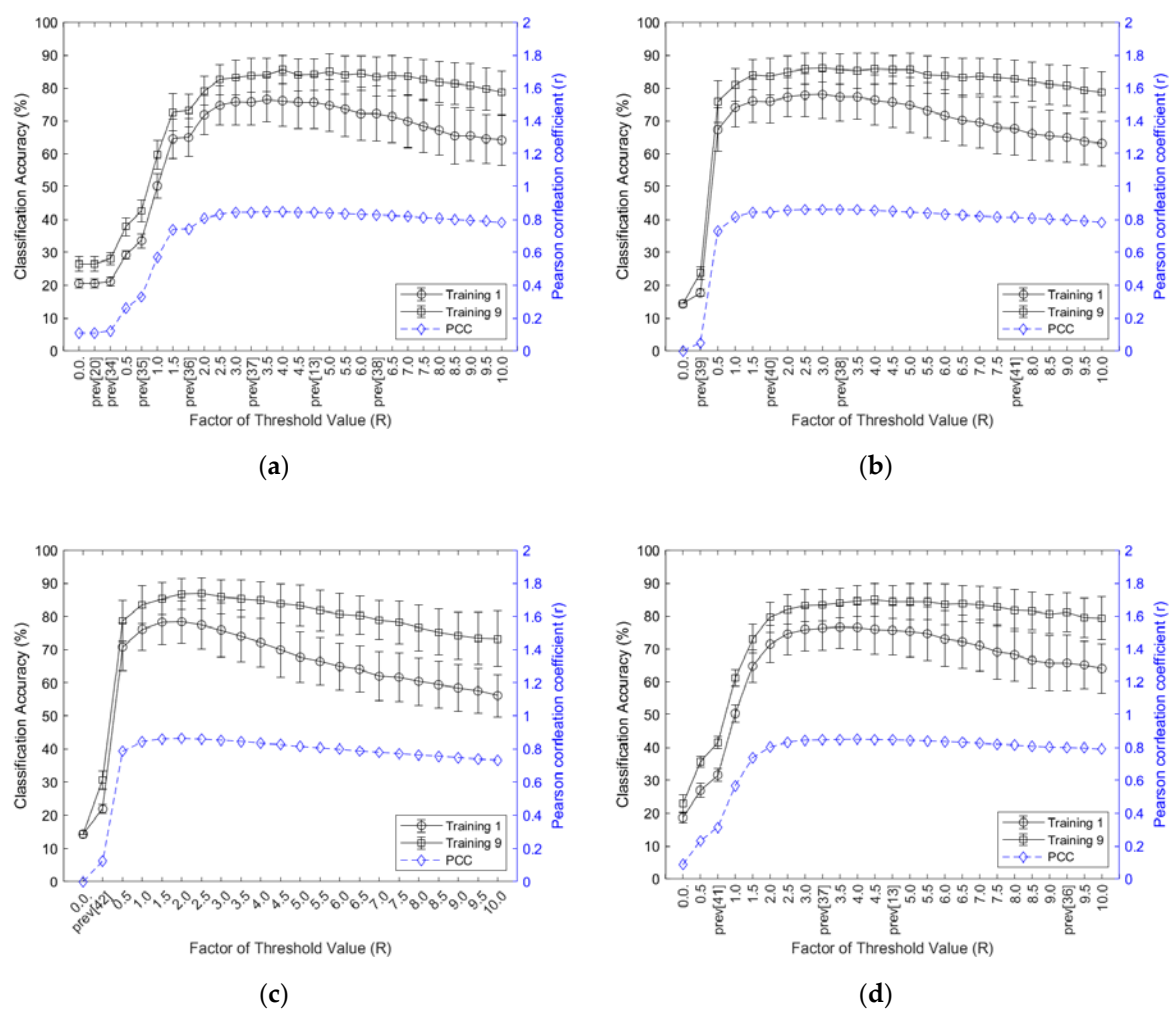
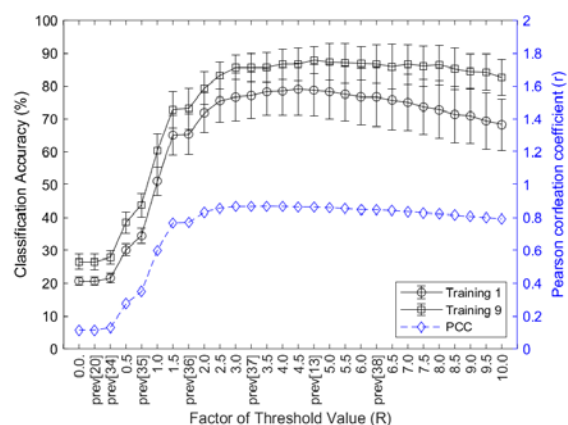
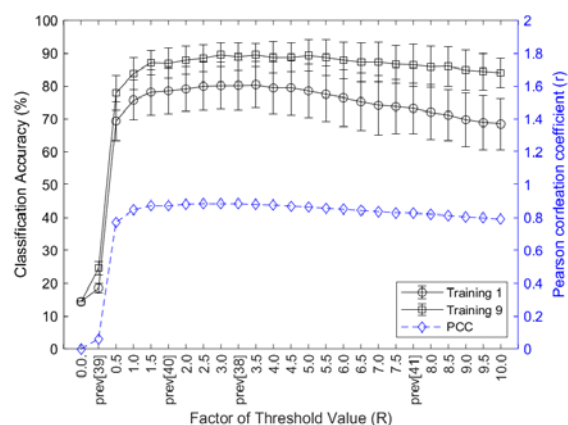


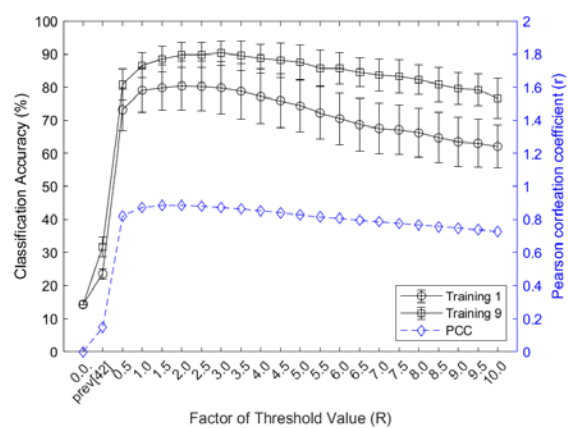
Figure S2. Classification accuracy and inter-session PCC of Group 3 by threshold values: (a) ZC; (b) WAMP; (c) MYOP; (d) SSC; prev: threshold value from the previous study.



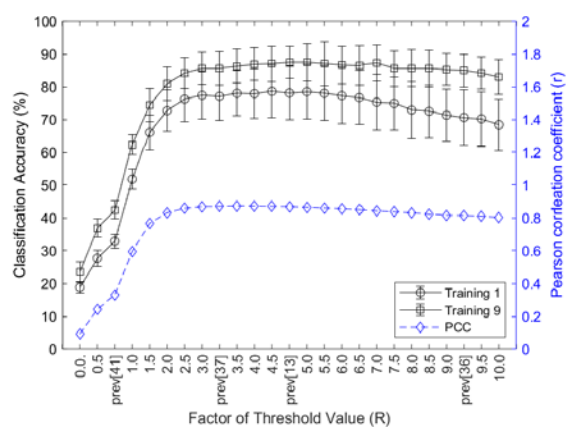
(a)



(b)



(c)



(d)

Figure S3. Classification accuracy and inter-session PCC of Group 4 by threshold values: (a) ZC; (b) WAMP; (c) MYOP; (d) SSC; prev: threshold value from the previous study.

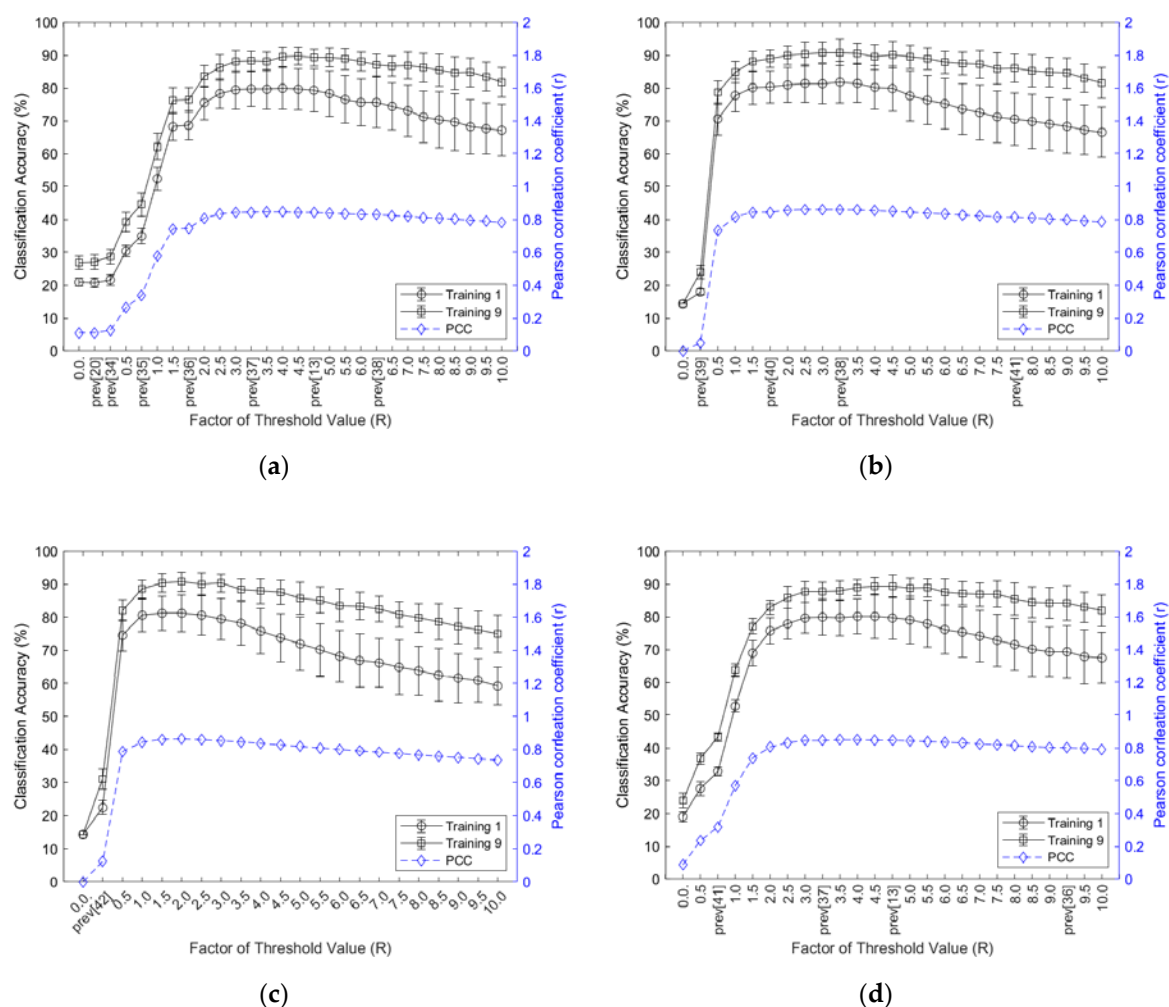
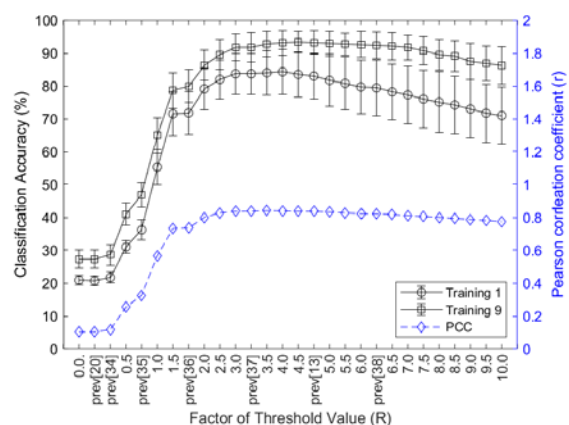
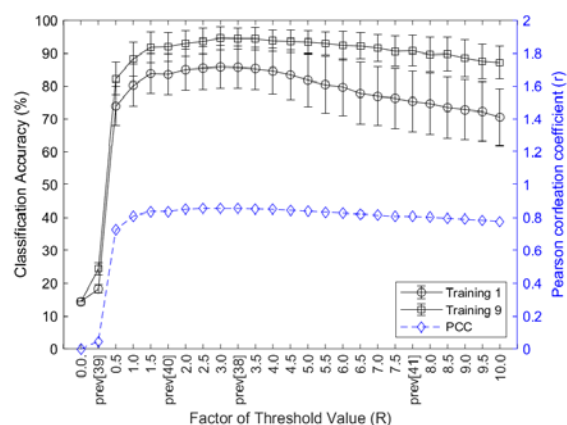


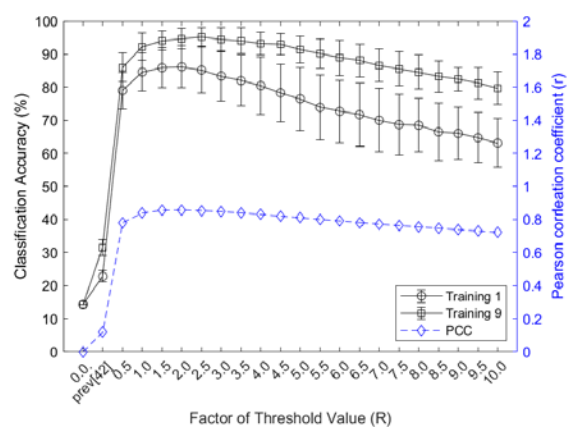
Figure S4. Classification accuracy and inter-session PCC of Group 5 by threshold values: (a) ZC; (b) WAMP; (c) MYOP; (d) SSC; prev: threshold value from the previous study



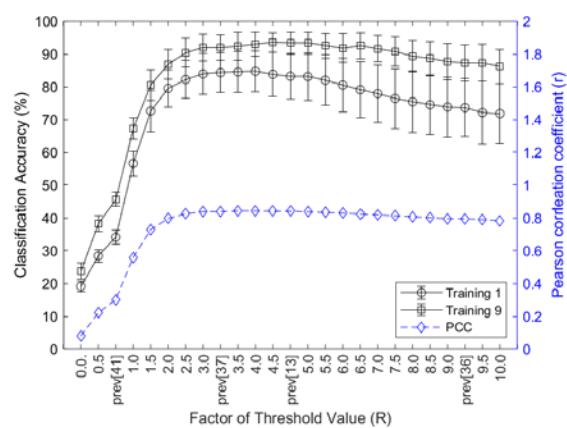
(a)



(b)

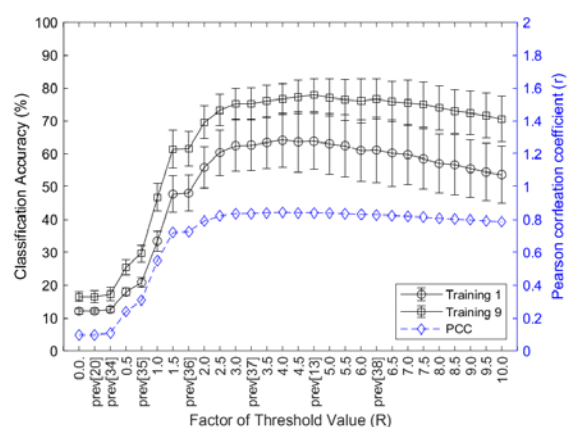


(c)

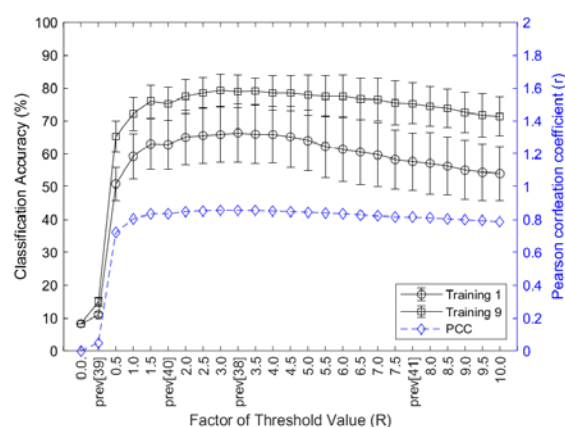


(d)

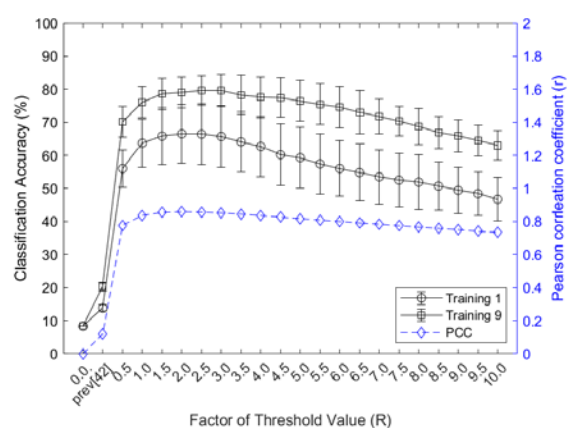
Figure S5. Classification accuracy and inter-session PCC of Group 6 by threshold values: (a) ZC; (b) WAMP; (c) MYOP; (d) SSC; prev: threshold value from the previous study.



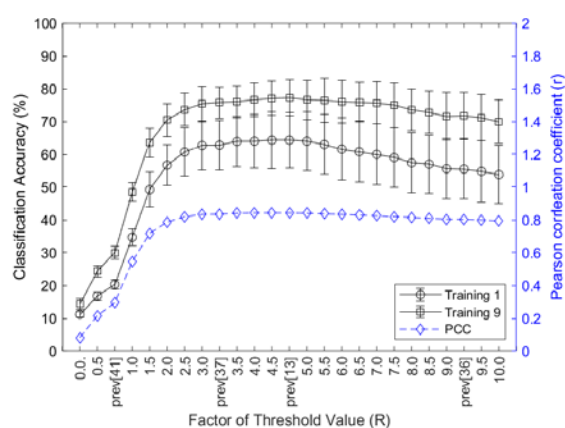
(a)



(b)

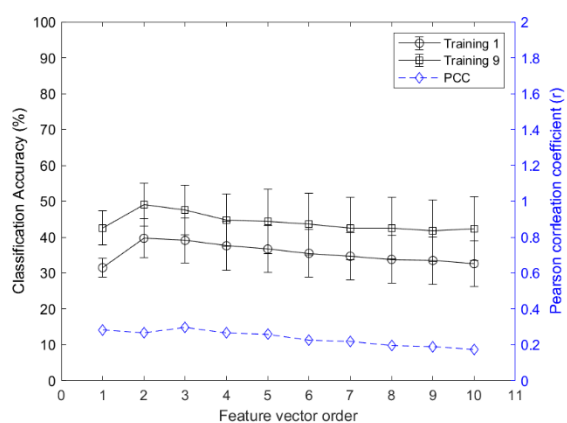


(c)

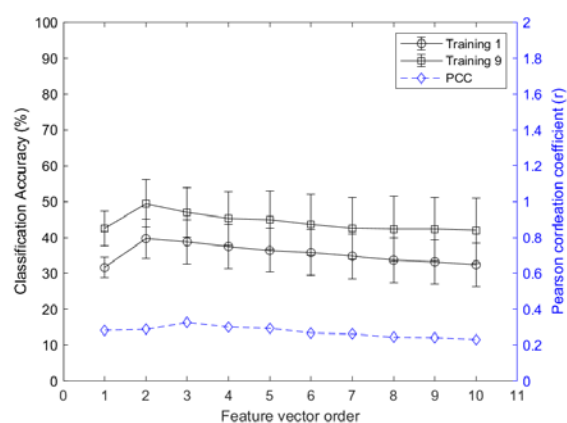


(d)

Figure S6. Classification accuracy and inter-session PCC of Group 7 by threshold values: (a) ZC; (b) WAMP; (c) MYOP; (d) SSC; prev: threshold value from the previous study.

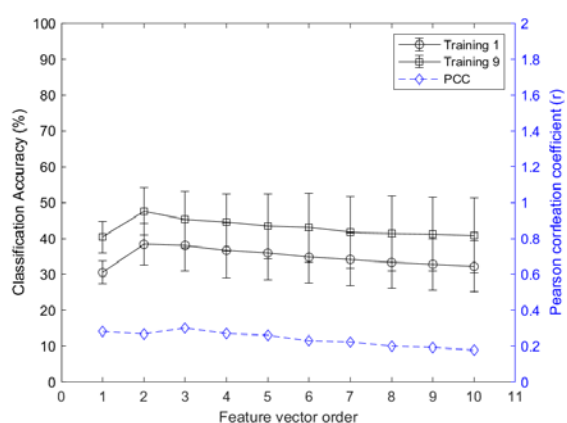


(a)

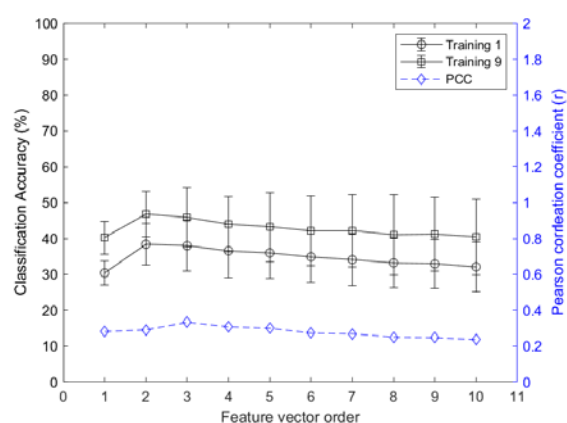


(b)

Figure S7. Classification accuracy and inter-session PCC of Group 2 by feature vector order: (a) AR; (b) CC.

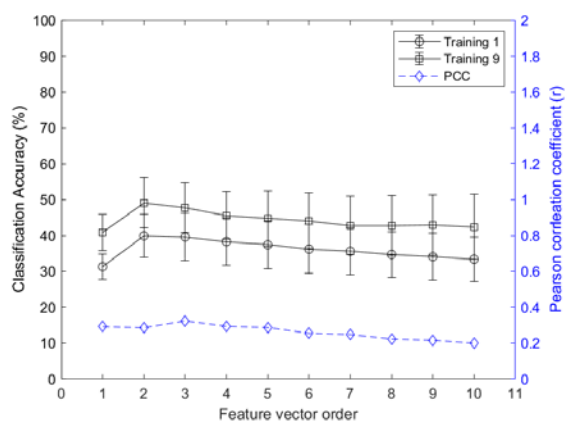


(a)

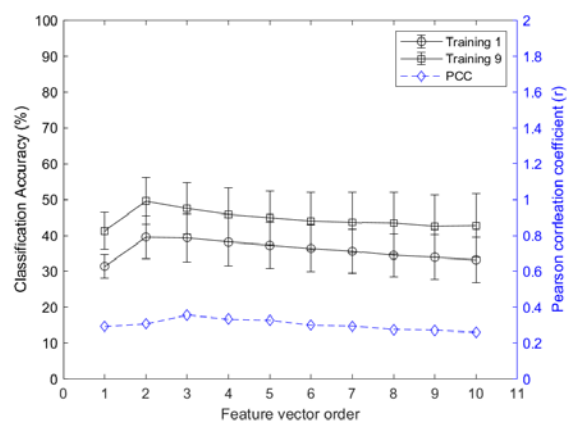


(b)

Figure S8. Classification accuracy and inter-session PCC of Group 3 by feature vector order: (a) AR; (b) CC.

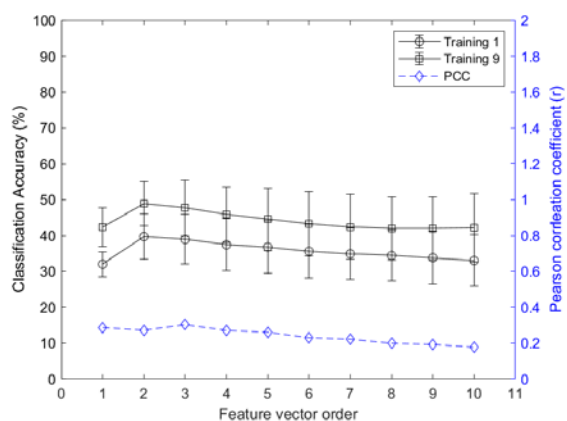


(a)

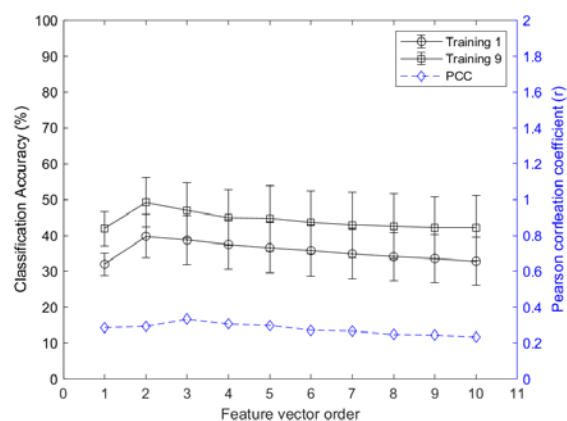


(b)

Figure S9. Classification accuracy and inter-session PCC of Group 4 by feature vector order: (a) AR; (b) CC.

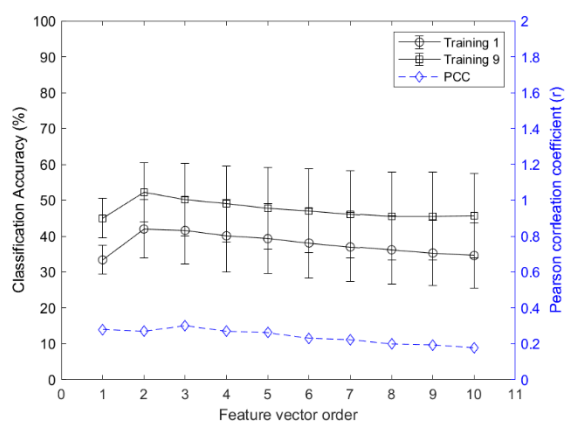


(a)

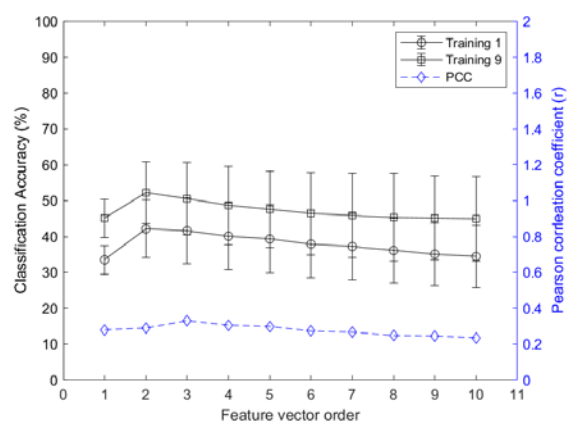


(b)

Figure S10. Classification accuracy and inter-session PCC of Group 5 by feature vector order: (a) AR; (b) CC.



(a)



(b)

Figure S11. Classification accuracy and inter-session PCC of Group 6 by feature vector order: (a) AR; (b) CC.

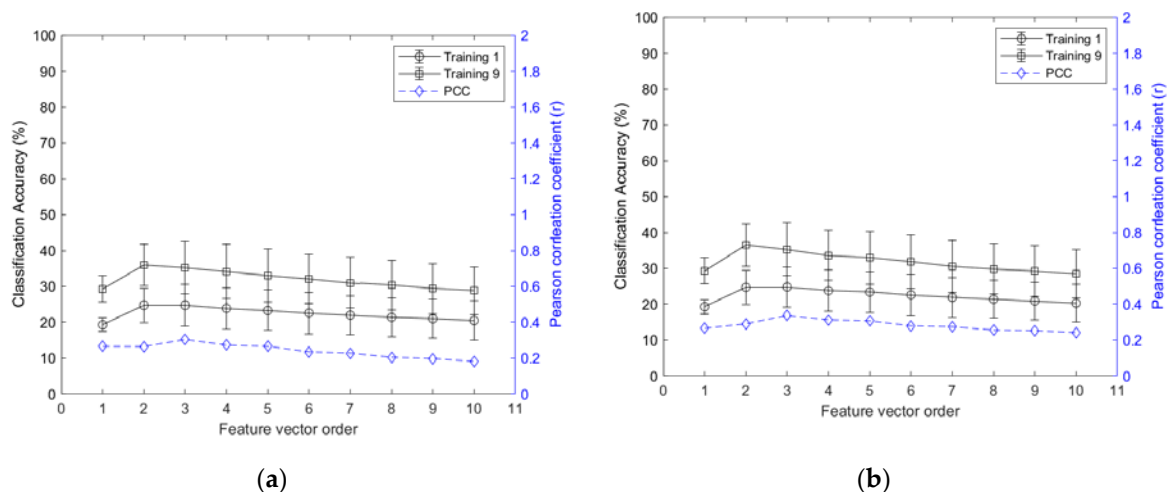


Figure S12. Classification accuracy and inter-session PCC of Group 7 by feature vector order: (a) AR; (b) CC.

Table S1. Classification accuracy and inter-session PCC of the feature vectors in Group 2.

Feature vector	Classification accuracy (%): mean (standard deviation)									PCC (r)
	TRN1	TRN2	TRN3	TRN4	TRN5	TRN6	TRN7	TRN8	TRN9	
IEMG	80.8 (6.8)	87.2 (3.7)	89.4 (2.8)	90.9 (2.2)	91.3 (1.9)	91.8 (2.0)	92.1 (2.2)	92.7 (1.9)	93.2 (2.1)	0.831
MAV	80.9 (6.6)	87.0 (3.3)	89.8 (2.7)	90.8 (2.2)	91.4 (1.8)	91.9 (2.1)	92.3 (1.9)	92.4 (2.3)	93.6 (2.2)	0.831
MAV1	80.6 (6.6)	87.0 (3.6)	89.5 (2.5)	90.5 (2.0)	91.6 (1.6)	91.5 (2.0)	92.1 (2.2)	93.0 (1.8)	93.1 (1.9)	0.829
MAV2	79.5 (5.6)	85.1 (2.5)	86.8 (1.6)	88.1 (1.5)	88.5 (1.8)	89.2 (1.5)	89.8 (1.8)	90.2 (1.6)	90.6 (1.9)	0.802
SSI	74.9 (7.5)	83.2 (4.6)	87.1 (3.2)	88.4 (2.8)	89.8 (2.0)	90.5 (2.2)	91.1 (2.0)	91.5 (2.1)	92.6 (1.6)	0.735
VAR	75.7 (8.1)	82.8 (4.4)	86.5 (3.5)	88.3 (2.1)	89.6 (2.3)	90.5 (2.2)	91.5 (1.7)	92.0 (1.7)	91.7 (2.4)	0.735
TM3	61.6 (5.9)	70.2 (4.1)	73.6 (3.9)	75.7 (3.8)	76.8 (3.8)	77.5 (3.9)	78.3 (3.7)	78.5 (3.7)	78.8 (3.9)	0.393
TM4	64.8 (9.3)	74.3 (6.2)	77.8 (6.0)	80.2 (5.5)	81.7 (5.3)	82.4 (5.4)	83.6 (4.9)	83.7 (5.3)	84.7 (5.2)	0.430
TM5	57.1 (7.3)	63.8 (6.8)	65.8 (7.0)	66.3 (7.0)	66.8 (6.9)	66.9 (6.9)	66.8 (7.1)	67.0 (7.0)	67.2 (6.9)	0.249
RMS	80.1 (6.2)	86.8 (3.5)	89.4 (2.9)	90.8 (1.9)	91.4 (1.8)	91.7 (2.2)	92.7 (1.6)	92.6 (1.9)	93.1 (1.7)	0.822
LOG	81.3 (6.1)	85.9 (3.8)	88.3 (2.3)	89.3 (2.4)	89.8 (1.9)	90.4 (1.8)	90.8 (1.9)	90.9 (2.1)	91.4 (2.1)	0.849
WL	79.8 (7.1)	86.4 (3.6)	89.2 (2.6)	90.7 (2.0)	91.2 (1.8)	91.4 (2.1)	92.0 (1.7)	92.2 (1.7)	93.0 (1.8)	0.826
AAC	80.2 (6.6)	86.9 (3.3)	89.2 (2.4)	90.5 (2.2)	90.7 (1.7)	91.5 (1.6)	91.9 (1.7)	92.0 (2.0)	92.7 (1.6)	0.826
DASDV	79.9 (6.7)	86.6 (3.3)	89.1 (2.4)	90.3 (2.1)	91.3 (1.8)	91.7 (2.2)	91.5 (2.2)	92.3 (2.0)	92.2 (1.8)	0.817
MAVSLP	35.3 (3.2)	40.9 (3.3)	42.9 (3.2)	44.1 (3.1)	44.5 (3.2)	45.1 (3.0)	45.2 (3.0)	45.4 (3.1)	45.5 (3.1)	0.004
ZC	81.2 (6.6)	86.2 (3.3)	88.2 (2.6)	89.3 (2.5)	90.0 (2.0)	90.3 (2.2)	90.8 (2.1)	90.8 (2.3)	91.2 (2.3)	0.842
WAMP	82.6 (6.2)	87.6 (3.2)	89.8 (2.1)	90.7 (1.8)	91.2 (1.4)	91.3 (1.8)	91.6 (2.0)	91.9 (1.9)	92.7 (1.6)	0.857
MYOP	82.8 (5.9)	88.1 (3.1)	90.3 (1.9)	91.4 (1.6)	92.0 (1.8)	91.9 (1.8)	92.6 (1.9)	92.5 (2.2)	92.5 (2.2)	0.861

SSC	81.3 (6.5)	86.6 (3.4)	88.7 (2.8)	89.0 (2.8)	89.9 (2.1)	90.5 (2.3)	90.7 (2.4)	91.1 (2.3)	91.1 (2.4)	0.844
AR	39.7 (5.4)	41.5 (6.4)	41.6 (6.7)	43.0 (6.4)	44.6 (6.0)	45.9 (5.3)	47.4 (5.7)	48.3 (5.8)	49.1 (6.0)	0.267
CC	39.7 (5.5)	41.5 (6.3)	41.8 (6.8)	43.2 (6.2)	44.5 (6.0)	45.9 (5.7)	47.1 (5.7)	47.7 (6.0)	49.5 (6.6)	0.288

Table S2. Classification accuracy and inter-session PCC of the feature vectors in Group 3.

Feature vector	Classification accuracy (%): mean (standard deviation)									PCC (<i>r</i>)
	TRN1	TRN2	TRN3	TRN4	TRN5	TRN6	TRN7	TRN8	TRN9	
IEMG	75.1 (7.2)	81.2 (4.9)	83.5 (4.6)	84.8 (4.0)	85.8 (4.1)	86.2 (3.9)	86.4 (3.8)	87.0 (3.4)	87.6 (3.2)	0.826
MAV	75.5 (7.9)	81.2 (4.8)	83.6 (4.3)	84.8 (4.2)	85.7 (4.2)	86.2 (3.5)	86.6 (3.5)	86.1 (3.7)	87.6 (3.6)	0.826
MAV1	75.4 (7.8)	81.2 (5.1)	83.0 (4.6)	84.4 (4.1)	85.3 (4.1)	86.0 (4.0)	86.2 (3.4)	86.8 (3.5)	86.4 (3.8)	0.824
MAV2	73.9 (7.4)	79.2 (5.5)	80.5 (5.6)	81.9 (5.3)	82.7 (5.2)	83.4 (4.6)	84.2 (4.2)	84.8 (4.4)	85.5 (3.9)	0.797
SSI	70.1 (8.1)	77.1 (4.7)	80.6 (3.8)	82.6 (2.8)	83.8 (3.3)	84.8 (2.7)	85.8 (2.6)	86.7 (2.6)	87.5 (2.9)	0.726
VAR	70.3 (8.2)	77.3 (4.8)	80.8 (3.6)	82.5 (3.3)	84.3 (3.0)	84.7 (3.2)	86.0 (2.5)	86.1 (3.0)	87.7 (2.3)	0.726
TM3	58.0 (6.2)	65.7 (5.4)	69.3 (5.1)	71.5 (4.6)	72.9 (5.0)	73.7 (5.0)	74.3 (5.2)	74.9 (5.2)	75.4 (5.5)	0.389
TM4	60.8 (6.9)	69.6 (5.3)	74.1 (4.2)	76.6 (2.9)	77.9 (3.2)	79.7 (3.4)	80.3 (3.3)	80.7 (3.6)	81.3 (3.9)	0.425
TM5	53.7 (5.9)	59.9 (6.0)	61.9 (6.0)	63.0 (5.8)	63.1 (6.0)	63.0 (6.0)	63.2 (6.1)	62.9 (6.3)	63.2 (6.5)	0.245
RMS	74.8 (7.1)	80.6 (5.0)	83.7 (4.1)	85.0 (3.7)	86.0 (3.8)	86.7 (3.6)	86.9 (3.7)	87.4 (2.7)	87.4 (3.4)	0.818
LOG	76.4 (6.9)	80.1 (5.3)	82.0 (5.5)	82.9 (5.4)	83.7 (5.3)	83.7 (5.5)	84.4 (5.2)	84.4 (5.2)	85.1 (5.2)	0.847
WL	74.9 (6.9)	80.8 (4.7)	83.2 (4.0)	84.4 (4.1)	85.3 (3.9)	86.0 (3.7)	86.2 (3.4)	86.8 (3.4)	86.9 (3.6)	0.822
AAC	74.9 (7.0)	80.6 (4.8)	83.3 (4.2)	84.5 (4.1)	85.6 (3.8)	86.1 (3.5)	86.4 (3.7)	87.0 (3.1)	86.6 (3.4)	0.822
DASDV	74.4 (7.2)	80.2 (4.8)	83.4 (4.1)	84.6 (3.8)	85.4 (3.6)	85.9 (3.7)	86.8 (3.4)	86.8 (3.3)	87.4 (3.3)	0.813
MAVSLP	34.4 (3.6)	39.5 (3.9)	41.4 (3.8)	42.5 (3.8)	43.0 (3.8)	43.3 (3.8)	43.6 (3.6)	44.0 (3.9)	44.0 (3.7)	0.005
ZC	76.1 (7.8)	79.9 (6.2)	82.2 (5.3)	82.7 (5.0)	83.0 (4.8)	83.8 (4.6)	84.3 (4.9)	84.4 (4.3)	85.7 (4.3)	0.845
WAMP	78.0 (7.2)	81.4 (6.2)	83.5 (5.4)	84.0 (5.0)	84.7 (5.1)	84.8 (5.0)	85.3 (4.9)	85.6 (4.8)	86.1 (4.4)	0.860
MYOP	78.4 (6.4)	81.9 (5.6)	83.5 (5.3)	84.5 (5.3)	85.3 (5.0)	85.1 (5.1)	85.8 (4.8)	85.8 (4.8)	86.7 (4.7)	0.864
SSC	76.5 (6.9)	80.1 (5.6)	81.5 (5.5)	82.7 (5.1)	82.9 (5.0)	83.5 (4.9)	83.9 (4.4)	84.2 (4.7)	84.6 (4.6)	0.849
AR	38.4 (5.8)	39.8 (6.7)	40.4 (6.9)	41.6 (6.6)	42.9 (6.2)	44.2 (6.0)	45.6 (6.2)	46.4 (6.4)	47.6 (6.6)	0.268
CC	38.4 (5.8)	40.0 (6.6)	40.2 (6.5)	41.5 (6.6)	43.1 (6.1)	44.2 (6.0)	45.2 (5.8)	46.3 (5.9)	46.8 (6.3)	0.291

Table S3. Classification accuracy and inter-session PCC of the feature vectors in Group 4.

Feature vector	Classification accuracy (%): mean (standard deviation)									PCC (<i>r</i>)
	TRN1	TRN2	TRN3	TRN4	TRN5	TRN6	TRN7	TRN8	TRN9	
IEMG	79.1 (7.6)	84.7 (5.2)	87.4 (4.4)	88.2 (4.3)	88.9 (4.0)	89.2 (4.0)	90.1 (3.9)	90.7 (4.0)	91.2 (4.0)	0.833
MAV	79.2 (7.8)	84.6 (5.1)	87.3 (4.6)	88.3 (4.2)	89.4 (3.8)	89.4 (3.8)	90.1 (3.8)	90.3 (4.2)	91.4 (3.6)	0.833
MAV1	79.6 (7.6)	84.4 (5.2)	86.9 (4.7)	88.1 (4.0)	88.8 (4.0)	89.5 (3.7)	90.2 (3.6)	90.4 (3.8)	91.4 (3.6)	0.831
MAV2	77.9 (7.6)	82.3 (5.2)	84.2 (4.8)	85.0 (4.3)	85.6 (4.3)	86.0 (4.4)	86.9 (4.4)	87.4 (4.1)	88.6 (4.0)	0.803
SSI	74.6 (8.9)	81.6 (5.8)	84.9 (5.4)	86.3 (4.5)	87.5 (4.1)	88.2 (4.1)	89.0 (4.0)	89.7 (4.0)	90.2 (4.1)	0.711
VAR	74.6 (8.5)	81.6 (5.7)	84.9 (5.0)	86.2 (4.7)	87.5 (4.5)	88.3 (3.9)	89.4 (3.9)	89.8 (4.3)	89.9 (4.2)	0.711
TM3	61.0 (7.1)	67.9 (6.0)	71.0 (5.3)	73.3 (5.2)	74.4 (5.1)	75.7 (5.2)	76.1 (5.1)	76.3 (5.7)	76.8 (5.8)	0.364
TM4	65.8 (9.4)	73.7 (6.8)	77.8 (6.2)	79.9 (5.3)	81.0 (5.1)	81.8 (5.2)	82.7 (5.2)	83.4 (5.0)	84.4 (4.9)	0.381
TM5	56.6 (7.5)	62.2 (6.6)	64.2 (6.7)	65.0 (6.8)	65.1 (7.0)	65.1 (7.5)	64.9 (7.7)	64.9 (7.9)	64.7 (8.4)	0.207
RMS	79.2 (7.9)	84.6 (5.5)	87.5 (4.5)	88.5 (4.2)	89.3 (4.0)	89.9 (3.7)	90.2 (3.9)	90.7 (3.9)	91.5 (3.5)	0.824
LOG	80.4 (7.2)	84.4 (5.0)	86.5 (4.0)	87.5 (3.5)	87.9 (3.8)	88.3 (3.9)	88.4 (3.8)	88.9 (3.5)	89.1 (3.7)	0.863
WL	78.7 (7.6)	84.7 (5.2)	86.7 (4.9)	88.0 (4.1)	89.0 (3.9)	89.3 (3.9)	89.3 (4.0)	89.8 (4.0)	90.5 (4.1)	0.827
AAC	78.7 (7.8)	84.6 (5.4)	86.8 (4.8)	88.1 (4.1)	88.6 (3.9)	89.0 (4.1)	89.2 (4.1)	89.3 (4.3)	90.3 (4.0)	0.827
DASDV	78.2 (8.3)	84.2 (5.6)	86.9 (4.9)	87.8 (4.4)	88.6 (4.3)	88.9 (4.3)	89.2 (4.4)	89.8 (4.2)	90.2 (4.3)	0.819
MAVSLP	36.0 (3.3)	41.1 (3.4)	43.1 (3.3)	44.0 (3.3)	44.5 (3.3)	45.0 (3.3)	45.2 (2.9)	45.5 (3.4)	45.3 (3.2)	0.005
ZC	78.4 (7.3)	82.6 (5.8)	84.2 (5.0)	85.1 (4.0)	85.3 (4.3)	85.8 (4.4)	85.9 (4.4)	85.8 (4.8)	86.6 (4.6)	0.868
WAMP	80.1 (7.1)	85.0 (5.1)	86.6 (4.6)	87.3 (4.3)	88.1 (3.9)	88.5 (3.7)	88.6 (4.0)	89.3 (3.6)	89.5 (3.7)	0.883
MYOP	80.4 (7.5)	85.4 (5.0)	87.1 (4.1)	87.9 (3.8)	88.7 (3.7)	88.7 (3.8)	89.4 (4.0)	88.9 (4.5)	89.8 (3.8)	0.886
SSC	77.9 (7.6)	82.3 (5.6)	84.3 (5.0)	85.2 (4.5)	85.6 (4.7)	85.9 (4.7)	85.7 (4.7)	86.2 (5.3)	86.9 (5.0)	0.872
AR	39.9 (6.0)	41.7 (6.6)	42.2 (7.1)	42.8 (6.5)	44.5 (6.1)	46.1 (6.1)	47.6 (6.2)	48.1 (6.9)	49.1 (7.0)	0.286
CC	39.6 (6.0)	41.8 (6.6)	41.9 (6.7)	43.3 (6.2)	44.3 (6.0)	45.9 (5.8)	47.1 (6.2)	48.4 (6.5)	49.6 (6.5)	0.307

Table S4. Classification accuracy and inter-session PCC of the feature vectors in Group 5.

Feature vector	Classification accuracy (%): mean (standard deviation)									PCC (r)
	TRN1	TRN2	TRN3	TRN4	TRN5	TRN6	TRN7	TRN8	TRN9	
IEMG	79.7 (6.4)	84.9 (4.8)	87.5 (3.5)	89.1 (3.3)	89.3 (3.2)	89.8 (2.6)	90.7 (2.4)	90.8 (3.2)	91.3 (3.1)	0.829
MAV	79.5 (6.4)	85.0 (4.8)	88.1 (3.3)	88.6 (3.5)	89.9 (2.9)	90.1 (2.2)	90.7 (2.4)	90.8 (2.7)	91.3 (3.7)	0.829
MAV1	79.6 (6.6)	85.1 (4.7)	87.6 (3.5)	88.6 (3.4)	89.5 (3.1)	90.0 (2.4)	90.3 (2.2)	90.6 (3.2)	90.7 (4.3)	0.827
MAV2	78.3 (5.7)	83.0 (4.2)	84.9 (3.2)	86.2 (2.7)	86.4 (2.4)	87.3 (2.1)	87.9 (2.2)	88.7 (2.2)	89.2 (2.0)	0.800
SSI	74.5 (7.2)	81.2 (5.2)	84.5 (4.3)	87.0 (3.4)	87.9 (3.2)	88.8 (2.7)	89.4 (2.9)	90.4 (2.6)	91.1 (3.0)	0.730
VAR	74.4 (7.6)	80.9 (5.1)	84.6 (4.6)	86.6 (3.1)	87.9 (3.1)	88.7 (2.9)	90.0 (3.0)	90.4 (2.4)	90.7 (3.7)	0.730
TM3	60.6 (5.7)	68.4 (4.1)	72.0 (3.6)	74.2 (3.3)	75.6 (3.6)	76.5 (3.4)	77.2 (3.6)	77.9 (3.7)	77.7 (3.9)	0.392
TM4	64.6 (8.1)	72.8 (6.9)	76.8 (5.6)	79.4 (5.2)	80.9 (4.9)	81.9 (5.1)	82.9 (4.8)	83.5 (5.3)	84.1 (5.3)	0.428
TM5	56.5 (7.2)	63.2 (6.3)	65.0 (6.7)	65.7 (6.7)	65.6 (7.1)	65.5 (7.4)	65.9 (7.2)	65.8 (7.6)	66.0 (7.5)	0.248
RMS	79.4 (6.7)	85.1 (4.5)	87.7 (3.5)	89.2 (2.8)	89.5 (3.1)	89.9 (2.3)	90.6 (2.3)	90.7 (2.8)	91.2 (3.4)	0.820
LOG	80.2 (5.9)	84.6 (4.6)	86.3 (4.4)	88.0 (3.8)	88.1 (3.6)	88.6 (3.8)	88.9 (3.3)	89.0 (3.4)	88.9 (4.2)	0.849
WL	79.0 (6.9)	84.7 (4.6)	87.5 (3.9)	88.7 (3.2)	89.4 (3.1)	89.6 (2.6)	90.4 (2.7)	90.8 (2.8)	91.3 (3.2)	0.824
AAC	79.1 (6.9)	85.0 (4.8)	87.2 (4.1)	88.4 (3.2)	89.2 (3.0)	89.7 (2.7)	90.4 (2.6)	90.7 (3.3)	91.5 (3.5)	0.824
DASDV	79.0 (7.2)	84.6 (4.6)	87.2 (3.9)	88.2 (3.5)	89.4 (3.0)	89.9 (2.9)	90.4 (2.9)	90.7 (2.9)	91.5 (3.2)	0.815
MAVSLP	35.3 (3.3)	40.6 (3.4)	42.6 (3.7)	43.7 (3.5)	44.2 (3.5)	44.6 (3.6)	44.9 (3.6)	45.1 (3.6)	45.1 (3.7)	0.005
ZC	79.9 (6.3)	84.3 (4.1)	86.0 (4.1)	87.2 (3.7)	88.0 (3.4)	88.5 (3.2)	88.6 (2.8)	89.1 (3.0)	89.4 (2.9)	0.845
WAMP	81.3 (6.0)	85.8 (4.2)	88.2 (3.7)	88.9 (3.6)	89.2 (3.5)	89.6 (3.4)	89.9 (3.5)	90.1 (3.3)	90.8 (3.2)	0.860
MYOP	81.2 (5.5)	85.9 (3.7)	88.1 (3.6)	89.1 (2.9)	89.8 (2.7)	90.3 (2.6)	90.2 (2.5)	90.6 (2.4)	90.7 (3.0)	0.864
SSC	80.1 (5.4)	84.3 (4.1)	86.3 (3.6)	87.4 (3.2)	87.7 (3.2)	88.2 (2.8)	88.6 (2.8)	88.6 (3.0)	88.9 (2.4)	0.849
AR	39.7 (6.3)	41.5 (7.1)	41.7 (7.5)	43.2 (6.9)	44.6 (6.6)	46.1 (6.4)	47.4 (6.2)	48.4 (6.6)	48.9 (6.2)	0.272
CC	39.8 (6.0)	41.7 (7.1)	41.9 (7.3)	43.2 (6.9)	44.8 (6.5)	46.0 (6.2)	47.4 (6.5)	48.3 (6.6)	49.2 (6.9)	0.294

Table S5. Classification accuracy and inter-session PCC of the feature vectors in Group 6.

Feature vector	Classification accuracy (%): mean (standard deviation)									PCC (<i>r</i>)
	TRN1	TRN2	TRN3	TRN4	TRN5	TRN6	TRN7	TRN8	TRN9	
IEMG	83.7 (8.2)	89.3 (5.4)	91.4 (4.3)	92.8 (3.7)	93.6 (3.3)	94.2 (2.9)	94.5 (2.8)	94.7 (2.8)	95.3 (2.3)	0.823
MAV	83.6 (8.6)	89.1 (5.7)	91.4 (4.3)	92.6 (3.6)	93.4 (3.4)	94.4 (3.1)	94.7 (2.7)	94.7 (2.9)	95.5 (2.0)	0.823
MAV1	83.9 (8.2)	89.2 (5.6)	91.1 (4.3)	92.6 (3.7)	93.4 (3.4)	94.4 (2.8)	94.2 (2.8)	94.6 (2.7)	95.3 (2.2)	0.821
MAV2	82.7 (8.2)	87.6 (5.8)	88.9 (5.2)	90.1 (4.7)	90.9 (4.2)	91.9 (4.0)	92.5 (3.9)	92.7 (3.5)	93.2 (3.4)	0.794
SSI	78.2 (8.8)	85.6 (6.5)	88.4 (5.5)	90.4 (4.4)	91.4 (4.0)	92.5 (3.5)	93.0 (3.2)	93.8 (2.8)	93.5 (2.8)	0.725
VAR	78.4 (8.9)	85.7 (6.2)	88.5 (5.4)	90.5 (4.3)	91.5 (4.0)	92.8 (3.1)	93.2 (3.1)	93.6 (3.1)	93.7 (3.2)	0.725
TM3	64.2 (6.8)	72.5 (5.8)	75.6 (5.7)	77.1 (5.6)	78.3 (5.8)	78.7 (6.1)	78.9 (6.5)	79.1 (6.9)	79.3 (7.5)	0.394
TM4	68.0 (9.2)	76.0 (9.2)	79.9 (8.0)	81.4 (7.4)	82.6 (7.5)	83.0 (7.7)	83.6 (7.8)	83.6 (8.2)	83.7 (8.8)	0.425
TM5	58.8 (8.8)	64.2 (9.2)	65.6 (9.4)	66.3 (9.7)	66.3 (10.0)	66.3 (10.6)	66.1 (10.8)	65.8 (11.0)	65.3 (11.7)	0.253
RMS	83.2 (8.2)	89.0 (5.4)	90.9 (4.6)	92.4 (3.9)	93.5 (3.3)	94.3 (3.1)	94.4 (3.0)	94.6 (2.8)	95.3 (2.4)	0.814
LOG	84.6 (7.1)	88.4 (5.6)	90.0 (4.7)	91.0 (4.1)	91.8 (4.2)	92.3 (4.0)	92.4 (4.0)	92.8 (4.0)	93.2 (3.6)	0.843
WL	83.1 (8.6)	88.8 (5.8)	91.1 (4.3)	92.3 (3.8)	93.2 (3.3)	93.9 (3.4)	94.3 (3.2)	93.9 (3.3)	94.9 (2.8)	0.818
AAC	83.6 (8.4)	88.9 (5.6)	90.8 (4.6)	92.2 (3.8)	93.0 (3.4)	93.8 (3.3)	94.0 (3.0)	94.3 (2.9)	94.8 (3.1)	0.818
DASDV	82.7 (9.1)	88.6 (5.8)	90.9 (4.5)	92.4 (3.5)	93.3 (3.2)	94.0 (3.0)	94.1 (3.1)	94.4 (2.7)	94.3 (2.7)	0.810
MAVSLP	37.6 (4.4)	42.9 (4.6)	45.0 (4.7)	45.8 (4.8)	46.4 (4.6)	46.9 (4.8)	47.1 (4.7)	47.2 (4.9)	47.4 (4.5)	0.005
ZC	84.3 (6.9)	87.9 (4.9)	89.7 (4.5)	91.1 (4.0)	91.9 (4.0)	92.4 (3.8)	92.5 (3.9)	93.1 (3.7)	93.1 (3.8)	0.840
WAMP	85.8 (6.5)	89.5 (4.7)	91.1 (4.2)	92.3 (3.9)	93.1 (3.7)	93.6 (3.6)	93.8 (3.9)	94.3 (3.5)	94.5 (3.5)	0.854
MYOP	86.2 (6.4)	90.2 (4.4)	91.7 (3.7)	92.8 (3.4)	93.6 (3.0)	93.9 (3.1)	94.2 (3.1)	94.4 (3.1)	94.7 (3.1)	0.858
SSC	84.7 (6.3)	88.5 (4.8)	89.9 (4.2)	91.5 (3.8)	92.0 (3.7)	92.7 (3.5)	92.7 (3.5)	93.1 (3.5)	92.9 (3.7)	0.843
AR	42.0 (8.1)	43.9 (9.4)	44.8 (9.4)	45.9 (9.5)	47.5 (8.9)	48.5 (8.5)	50.0 (8.4)	51.1 (8.2)	52.2 (8.2)	0.270
CC	42.1 (8.0)	44.2 (9.3)	44.7 (9.5)	46.0 (9.2)	47.0 (8.9)	48.8 (8.8)	49.9 (8.6)	50.9 (7.9)	52.2 (8.6)	0.290

Table S6. Classification accuracy and inter-session PCC of the feature vectors in Group 7.

Feature vector	Classification accuracy (%): mean (standard deviation)									PCC (<i>r</i>)
	TRN1	TRN2	TRN3	TRN4	TRN5	TRN6	TRN7	TRN8	TRN9	
IEMG	65.6 (10.4)	71.8 (7.6)	74.9 (6.0)	76.2 (5.8)	77.4 (5.6)	78.4 (5.2)	78.9 (5.1)	80.1 (5.3)	81.0 (4.8)	0.821
MAV	65.5 (10.2)	71.8 (7.6)	74.5 (6.6)	76.4 (5.9)	77.2 (5.5)	78.5 (5.0)	78.8 (5.3)	79.8 (5.0)	80.9 (5.2)	0.821
MAV1	65.5 (10.6)	71.7 (7.3)	74.2 (6.3)	76.1 (5.5)	77.0 (5.4)	78.4 (5.0)	78.7 (5.0)	79.4 (5.2)	80.1 (5.5)	0.819
MAV2	63.1 (8.7)	68.3 (6.9)	71.3 (6.1)	73.6 (5.4)	75.3 (5.0)	76.8 (4.7)	77.8 (4.4)	78.9 (4.4)	79.6 (4.4)	0.792
SSI	61.2 (10.5)	69.0 (8.0)	72.9 (6.3)	75.6 (5.6)	77.4 (5.1)	79.0 (5.1)	79.9 (4.7)	80.3 (5.0)	81.6 (5.2)	0.709
VAR	61.3 (11.0)	68.7 (8.0)	73.2 (6.4)	75.5 (6.1)	77.3 (5.1)	79.1 (4.9)	80.0 (4.9)	81.1 (4.8)	81.6 (5.3)	0.709
TM3	48.0 (6.1)	54.5 (5.7)	57.1 (5.8)	58.6 (5.6)	59.4 (6.0)	59.8 (6.5)	60.4 (6.9)	60.2 (7.4)	60.8 (8.0)	0.379
TM4	52.9 (9.3)	61.0 (8.6)	64.3 (8.4)	65.6 (8.5)	66.6 (8.8)	67.4 (9.1)	67.9 (9.7)	68.0 (10.0)	67.6 (11.2)	0.395
TM5	42.6 (6.9)	46.3 (7.1)	46.9 (7.2)	46.7 (7.6)	46.5 (7.3)	46.2 (7.5)	46.2 (8.4)	45.9 (8.8)	46.0 (9.0)	0.229
RMS	65.1 (10.1)	71.8 (7.6)	74.7 (6.6)	76.2 (5.4)	77.4 (5.3)	78.8 (4.9)	79.3 (5.3)	80.3 (5.1)	81.0 (5.3)	0.811
LOG	65.4 (9.4)	70.0 (6.9)	71.4 (6.0)	72.8 (5.6)	73.8 (5.2)	75.1 (5.0)	75.8 (5.0)	77.0 (5.0)	78.2 (5.0)	0.844
WL	64.7 (9.9)	71.3 (7.1)	73.8 (6.2)	75.3 (5.8)	76.8 (5.2)	77.3 (5.1)	78.6 (4.7)	79.1 (5.0)	80.7 (4.8)	0.816
AAC	64.9 (10.1)	71.4 (7.1)	73.6 (6.4)	75.4 (5.5)	76.6 (5.7)	77.6 (5.0)	78.3 (5.1)	79.1 (5.0)	81.0 (4.5)	0.816
DASDV	63.9 (10.7)	70.7 (7.5)	74.0 (6.3)	75.6 (5.3)	77.1 (5.1)	78.0 (4.9)	79.0 (5.0)	79.7 (5.1)	80.6 (4.9)	0.807
MAVSLP	25.4 (2.5)	28.2 (2.5)	29.4 (2.5)	29.9 (2.7)	30.3 (2.3)	30.4 (2.6)	30.5 (2.4)	30.7 (2.5)	30.9 (2.8)	0.006
ZC	64.1 (8.2)	67.8 (6.8)	69.9 (5.5)	70.9 (5.0)	72.5 (4.8)	73.3 (4.9)	74.8 (4.8)	75.8 (5.1)	76.7 (4.7)	0.841
WAMP	65.8 (8.4)	71.0 (7.0)	72.4 (5.9)	73.4 (5.6)	75.0 (5.0)	75.8 (5.0)	76.9 (5.0)	77.9 (4.6)	79.3 (4.9)	0.855
MYOP	66.5 (9.0)	71.5 (7.2)	73.2 (6.1)	74.5 (5.5)	75.3 (5.0)	76.7 (4.9)	77.1 (5.1)	78.2 (5.0)	79.1 (4.7)	0.859
SSC	64.0 (8.1)	68.2 (6.8)	70.1 (5.8)	71.3 (5.2)	72.3 (5.0)	73.5 (4.9)	74.8 (4.7)	75.4 (5.5)	76.6 (5.1)	0.843
AR	24.7 (4.7)	26.5 (5.1)	29.0 (5.1)	31.0 (5.3)	32.4 (5.4)	33.6 (5.6)	34.8 (5.7)	35.6 (5.7)	35.9 (5.8)	0.265
CC	24.7 (4.7)	26.6 (5.0)	29.1 (5.1)	31.0 (5.3)	32.3 (5.5)	33.4 (5.5)	34.6 (5.7)	35.6 (5.6)	36.5 (5.9)	0.291

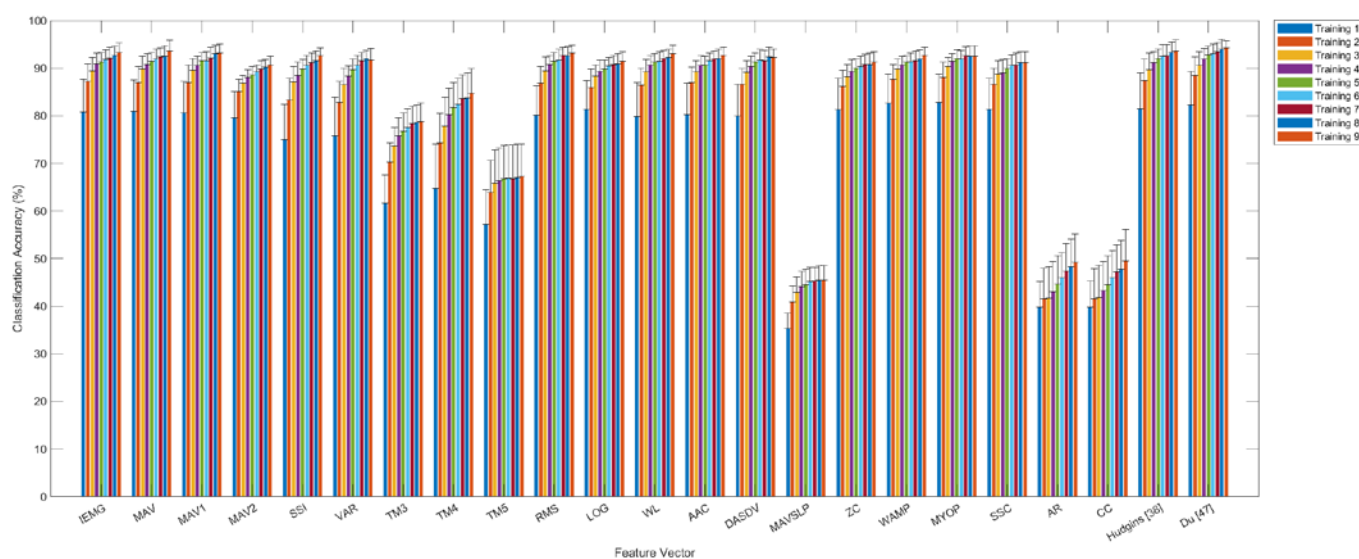


Figure S13. Classification accuracy of feature vectors and combinations by number of training sessions in Group 2.

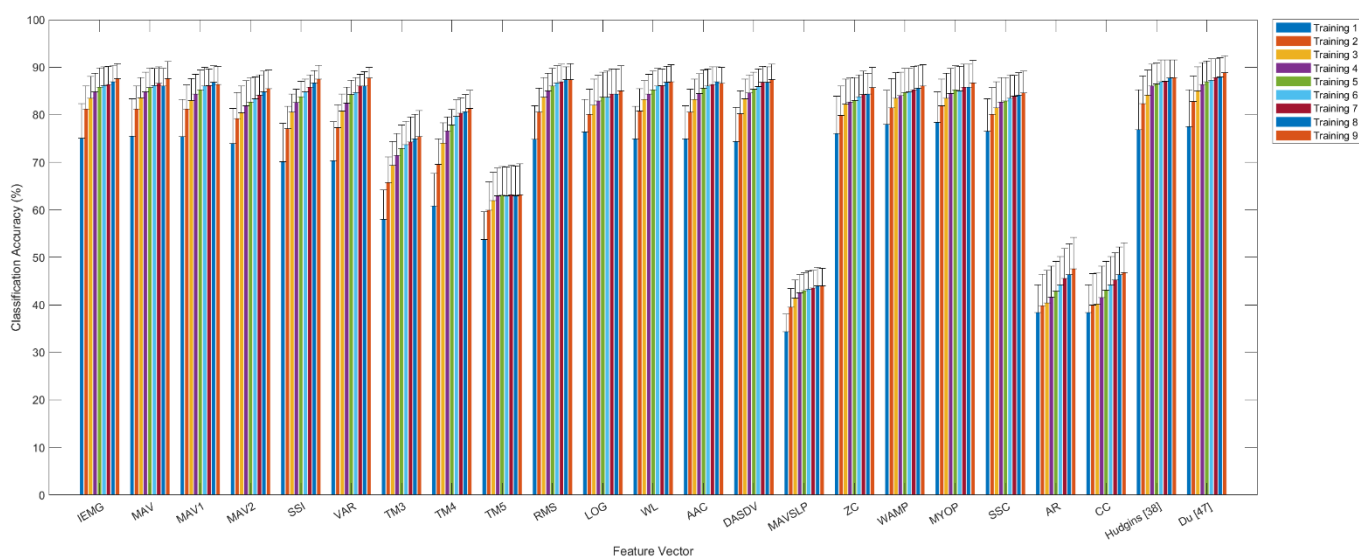


Figure S14. Classification accuracy of feature vectors and combinations by number of training sessions in Group 3.

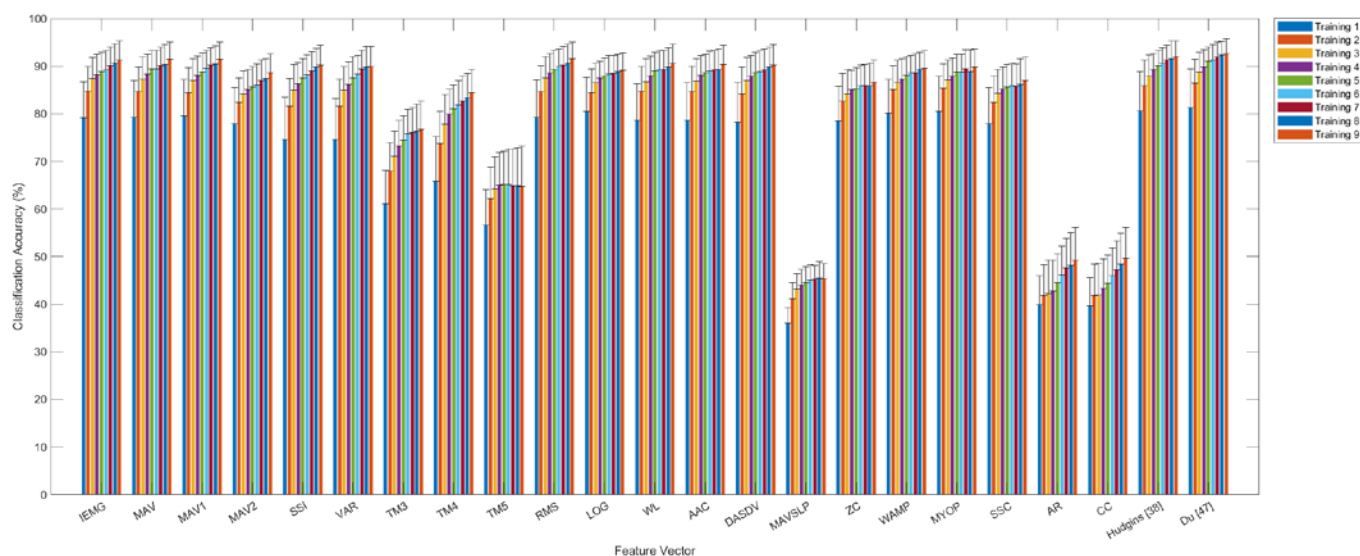


Figure S15. Classification accuracy of feature vectors and combinations by number of training sessions in Group 4.

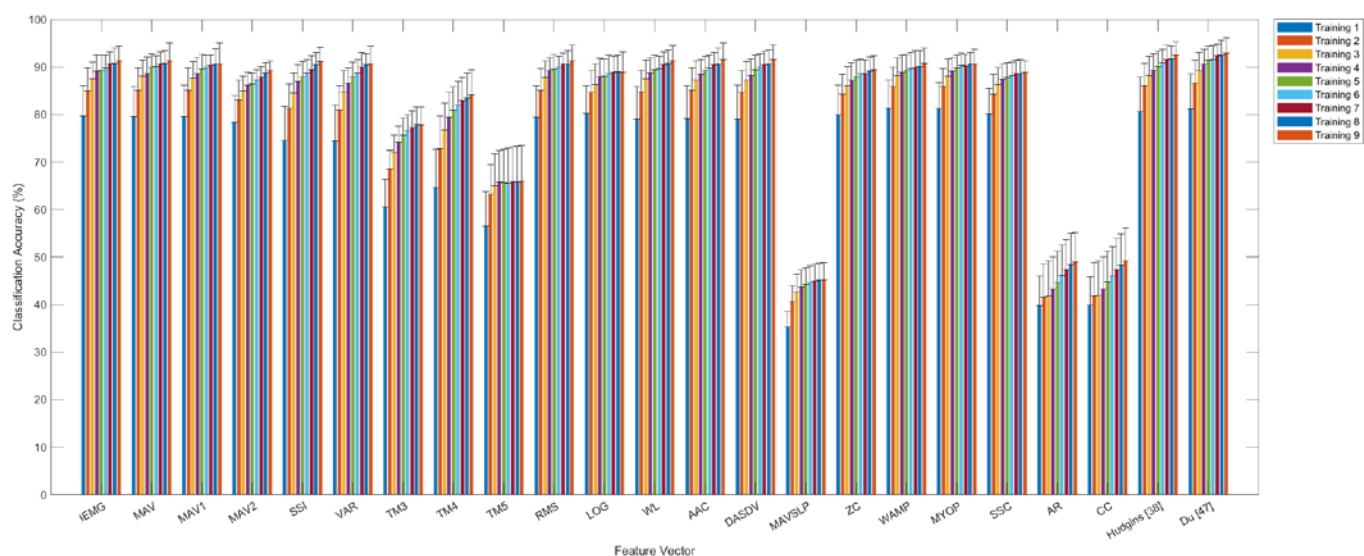


Figure S16. Classification accuracy of feature vectors and combinations by number of training sessions in Group 5

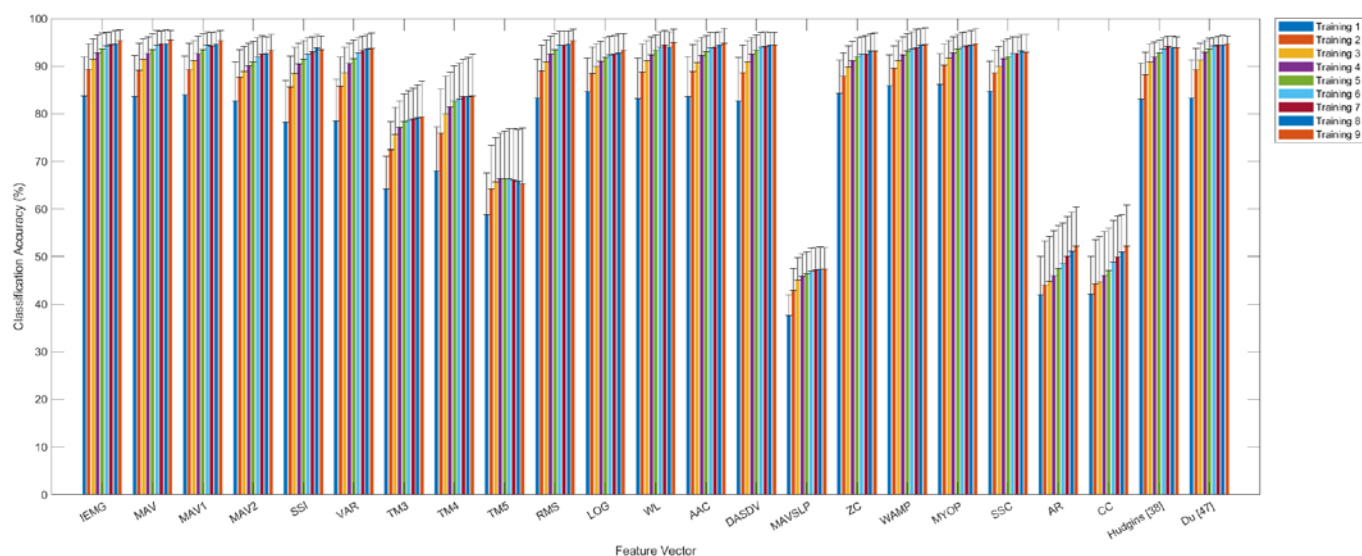


Figure S17. Classification accuracy of feature vectors and combinations by number of training sessions in Group 6.

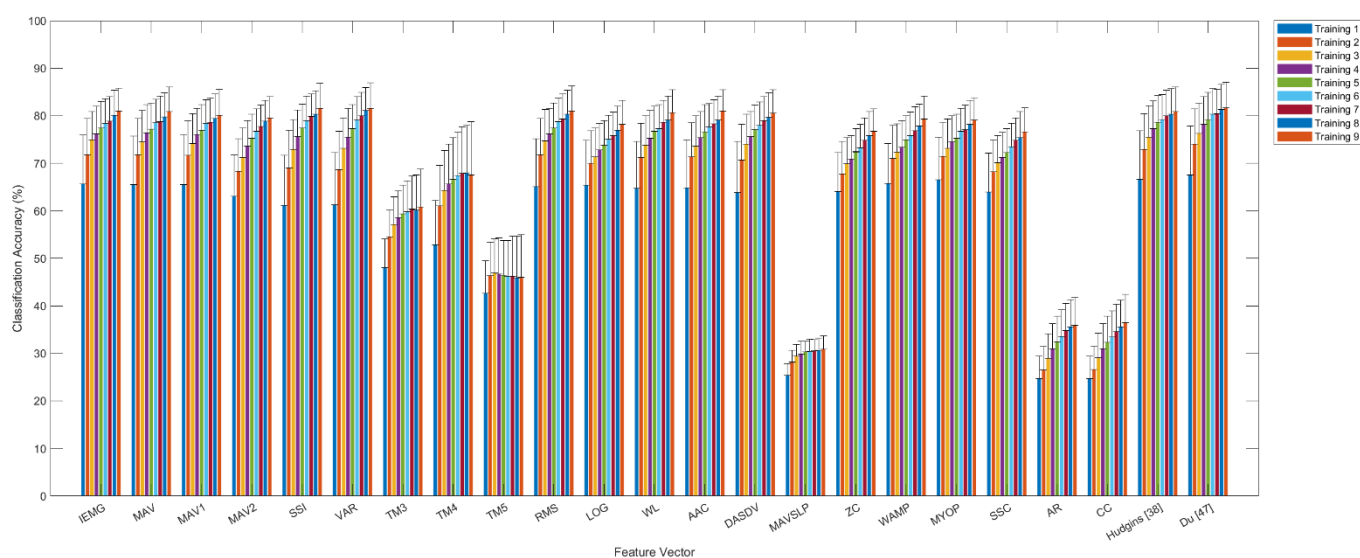


Figure S18. Classification accuracy of feature vectors and combinations by number of training sessions in Group 7.

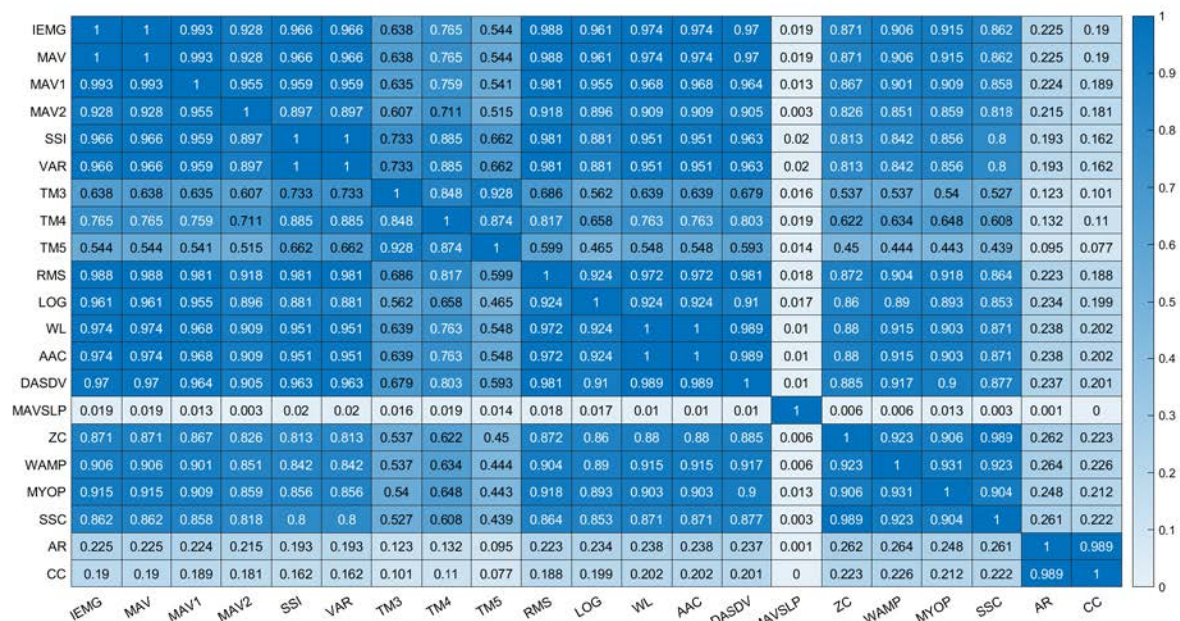


Figure S19. Confusion matrix of inter-feature PCC in Group 2.

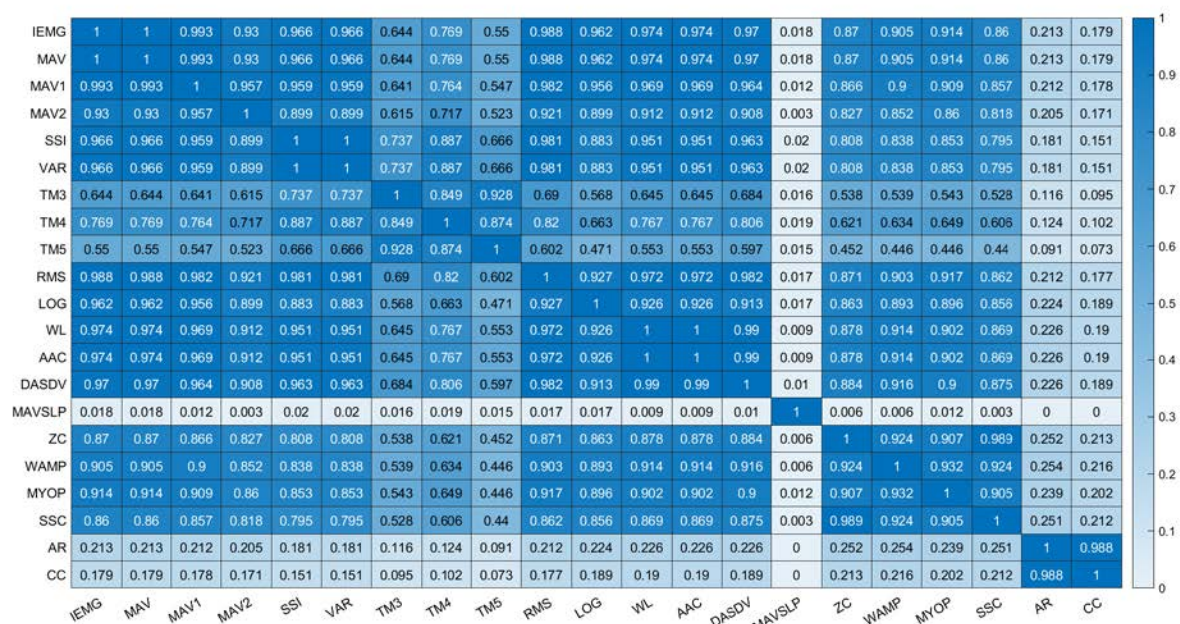


Figure S20. Confusion matrix of inter-feature PCC in Group 3.

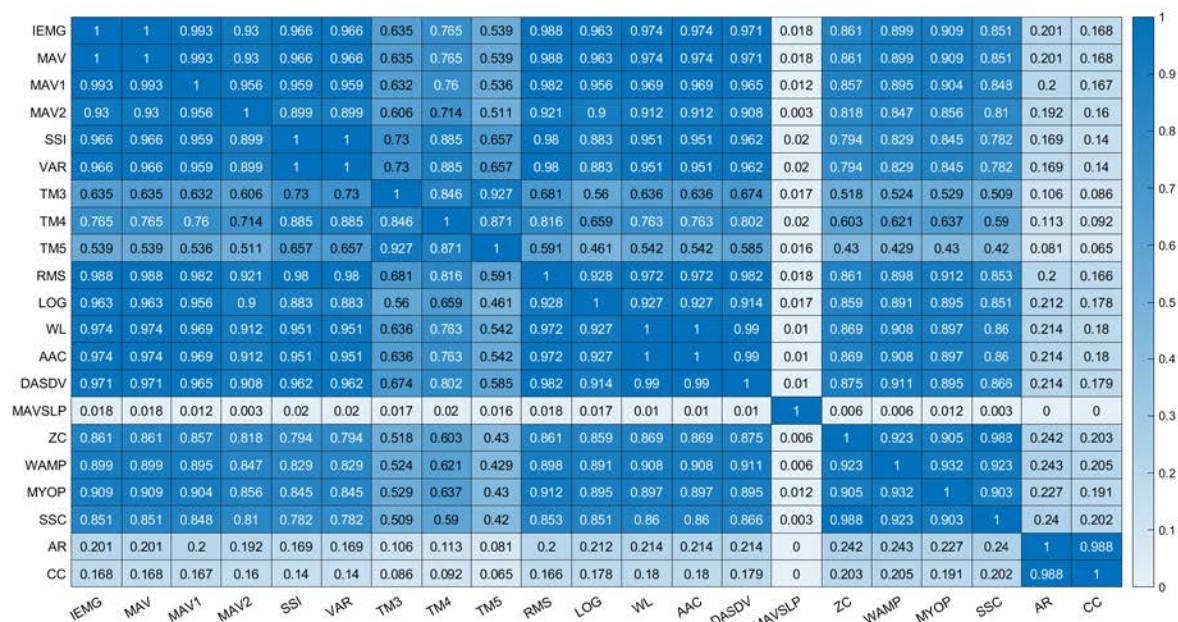


Figure S21. Confusion matrix of inter-feature PCC in Group 4.



Figure S22. Confusion matrix of inter-feature PCC in Group 5.



Figure S23. Confusion matrix of inter-feature PCC in Group 6.

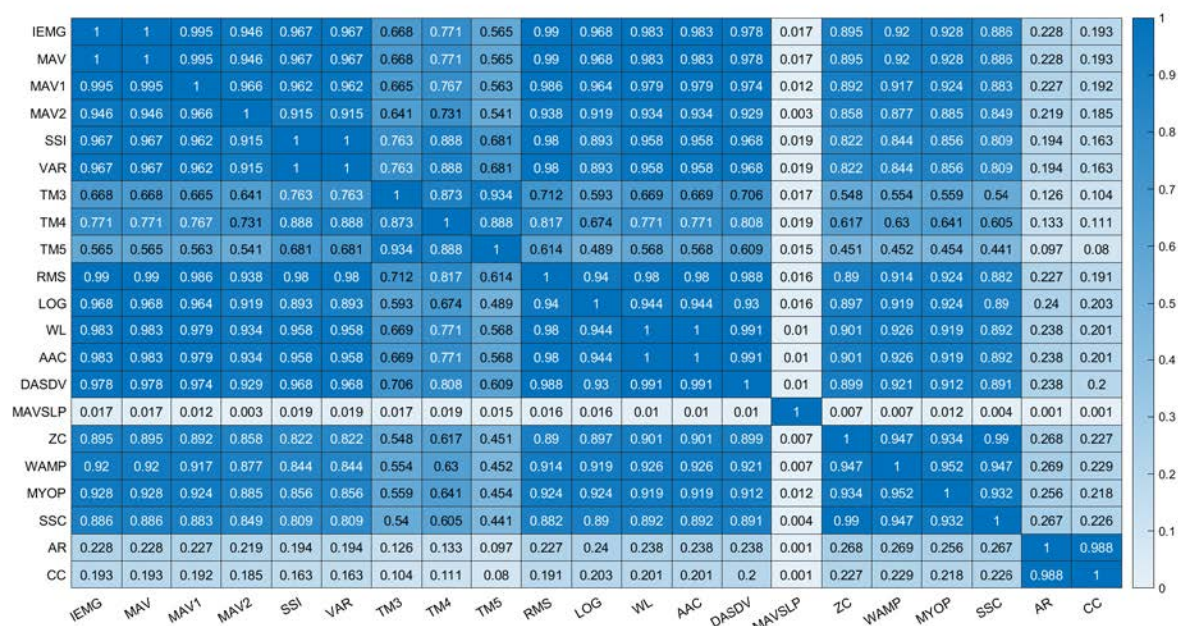


Figure S24. Confusion matrix of inter-feature PCC in Group 7.

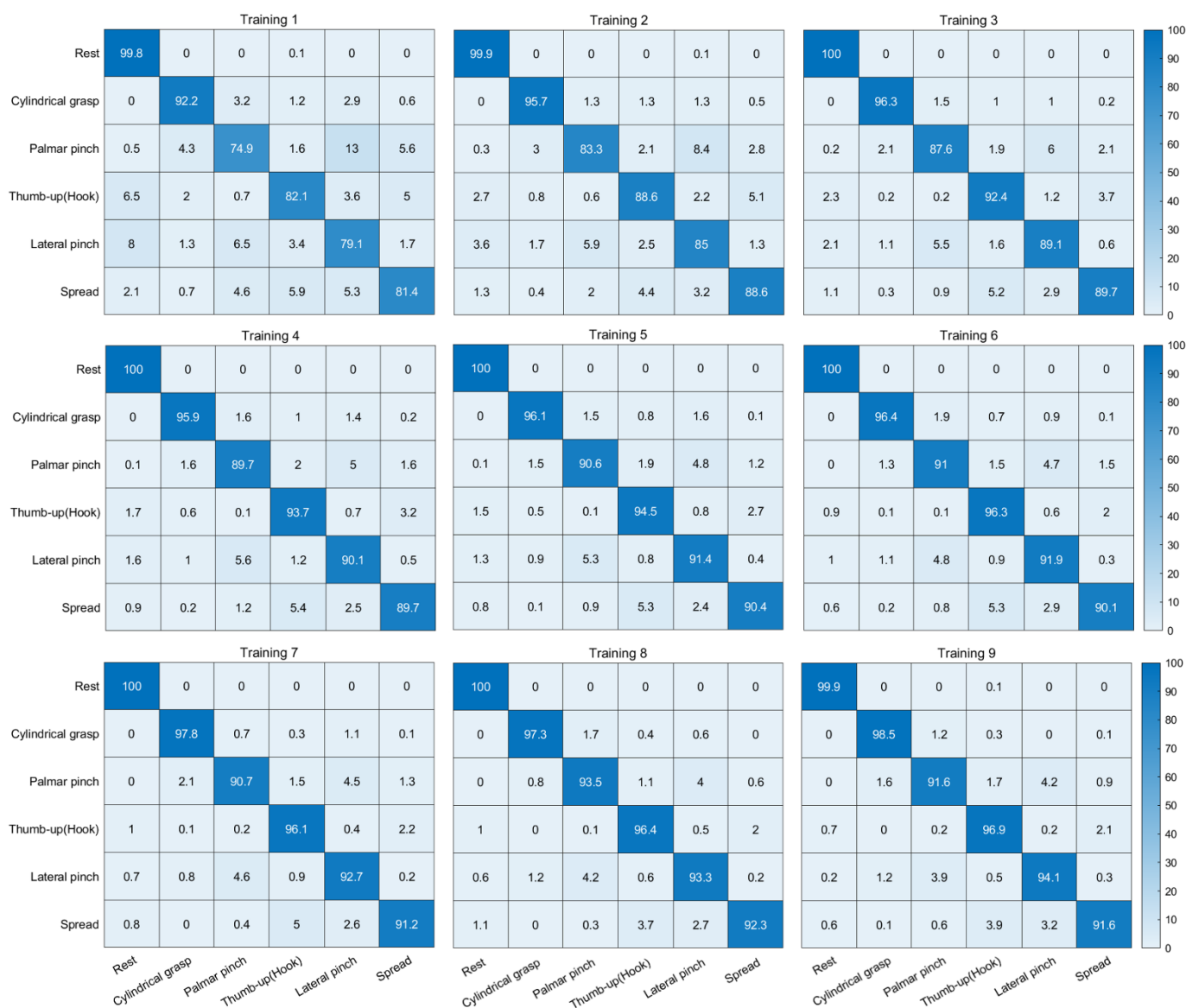


Figure S25. Confusion matrix of the hand postures of Group 1.

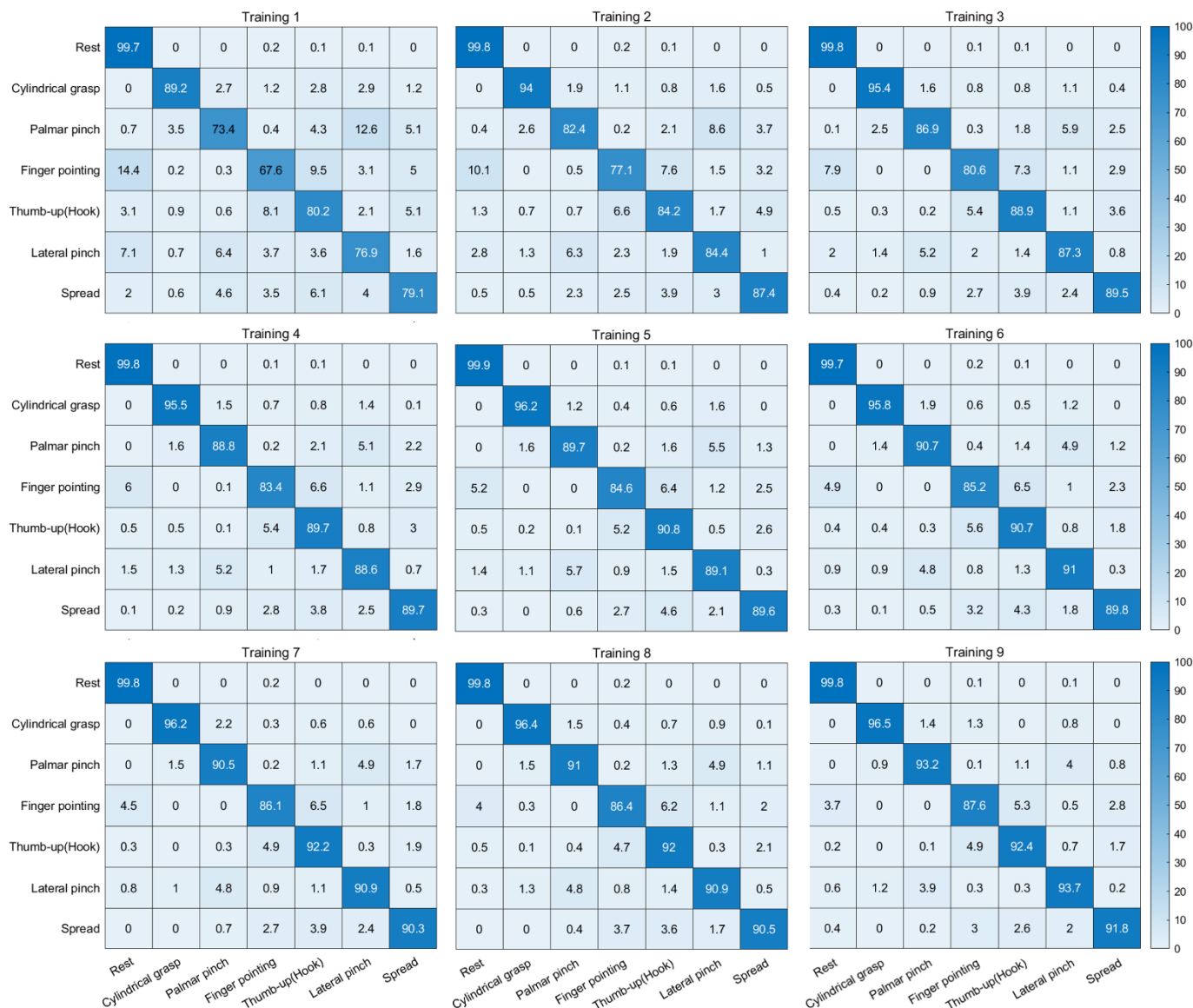


Figure S26. Confusion matrix of the hand postures of Group 2.

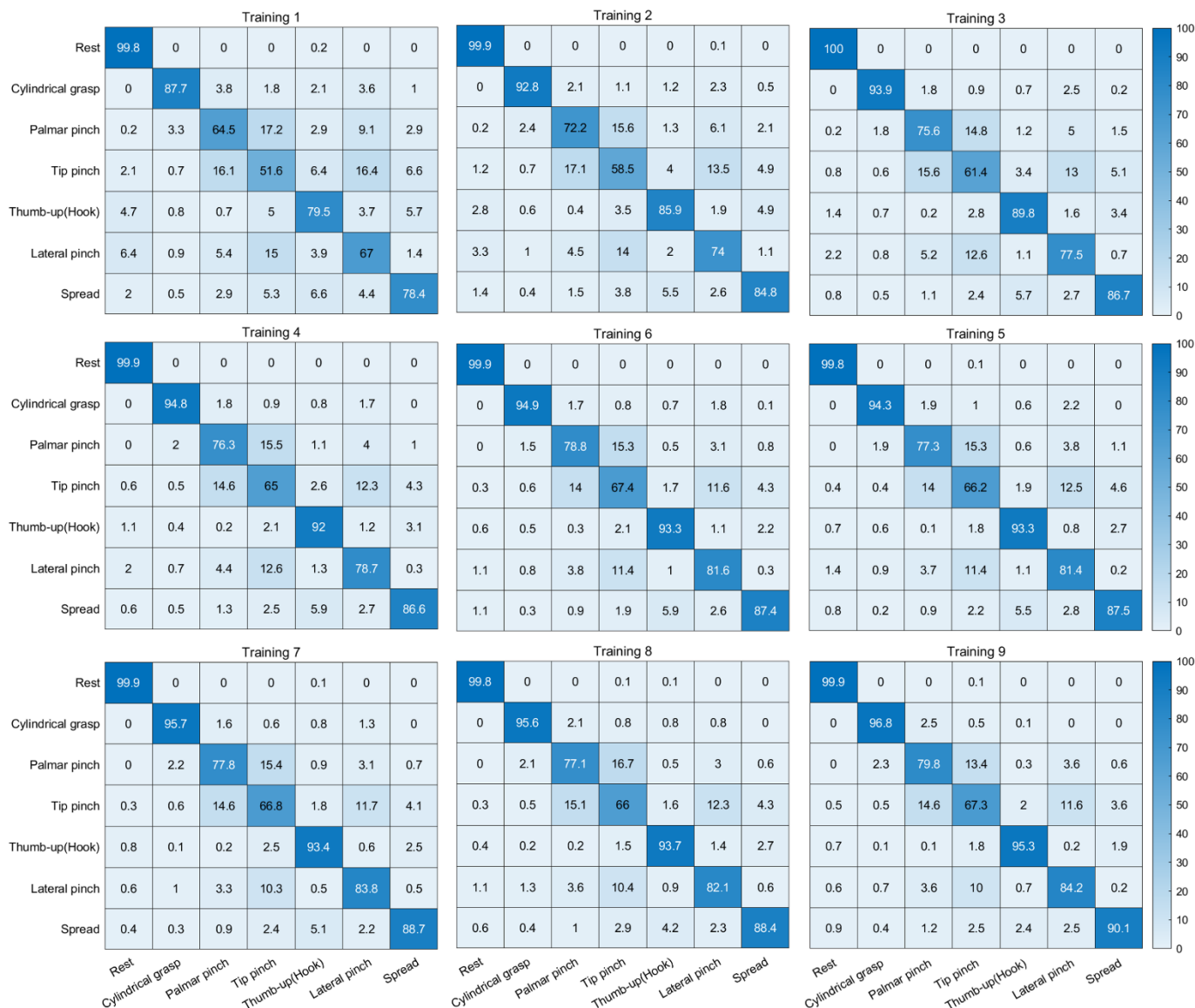


Figure S27. Confusion matrix of the hand postures of Group 3.

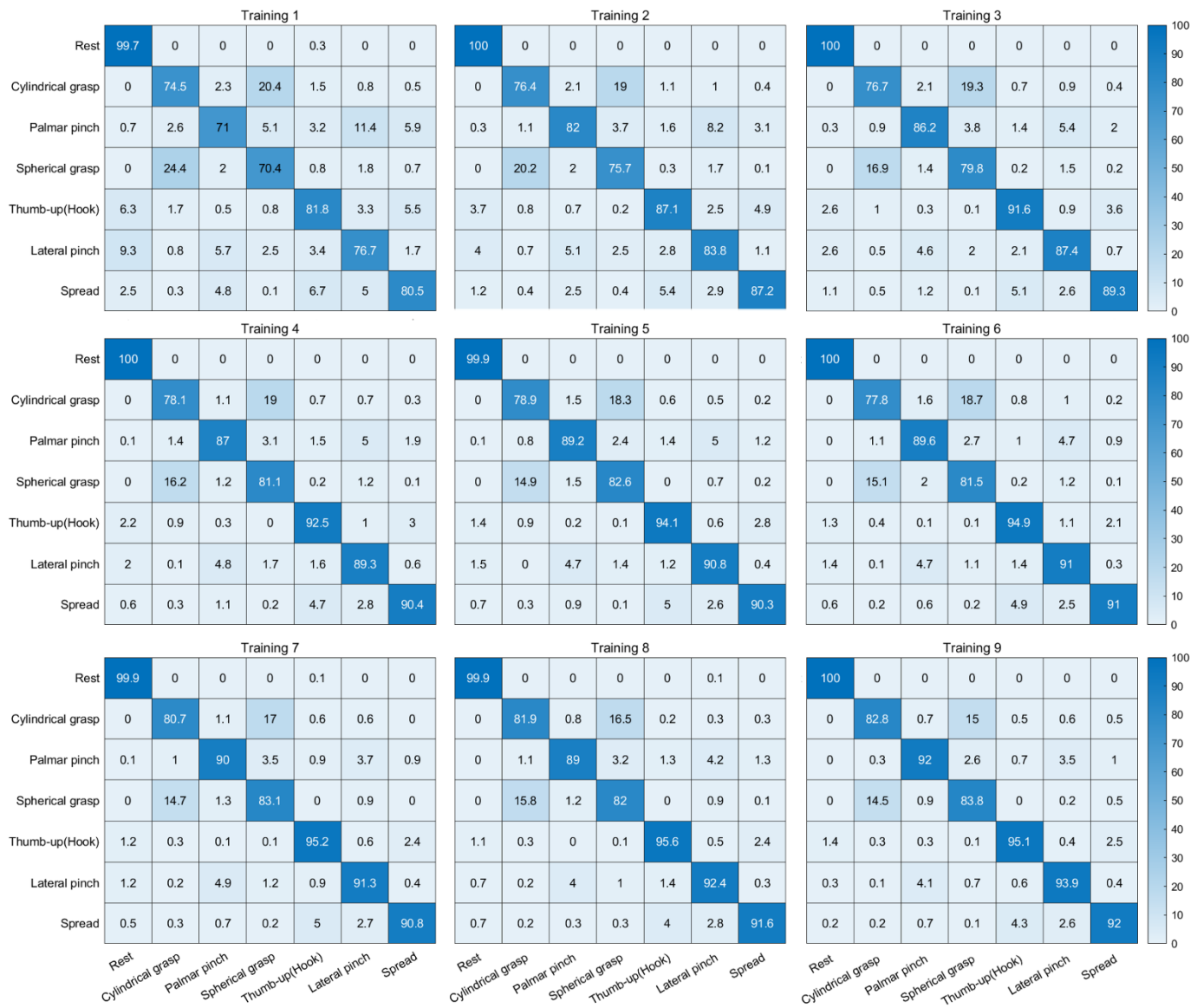


Figure S28. Confusion matrix of the hand postures of Group 4.

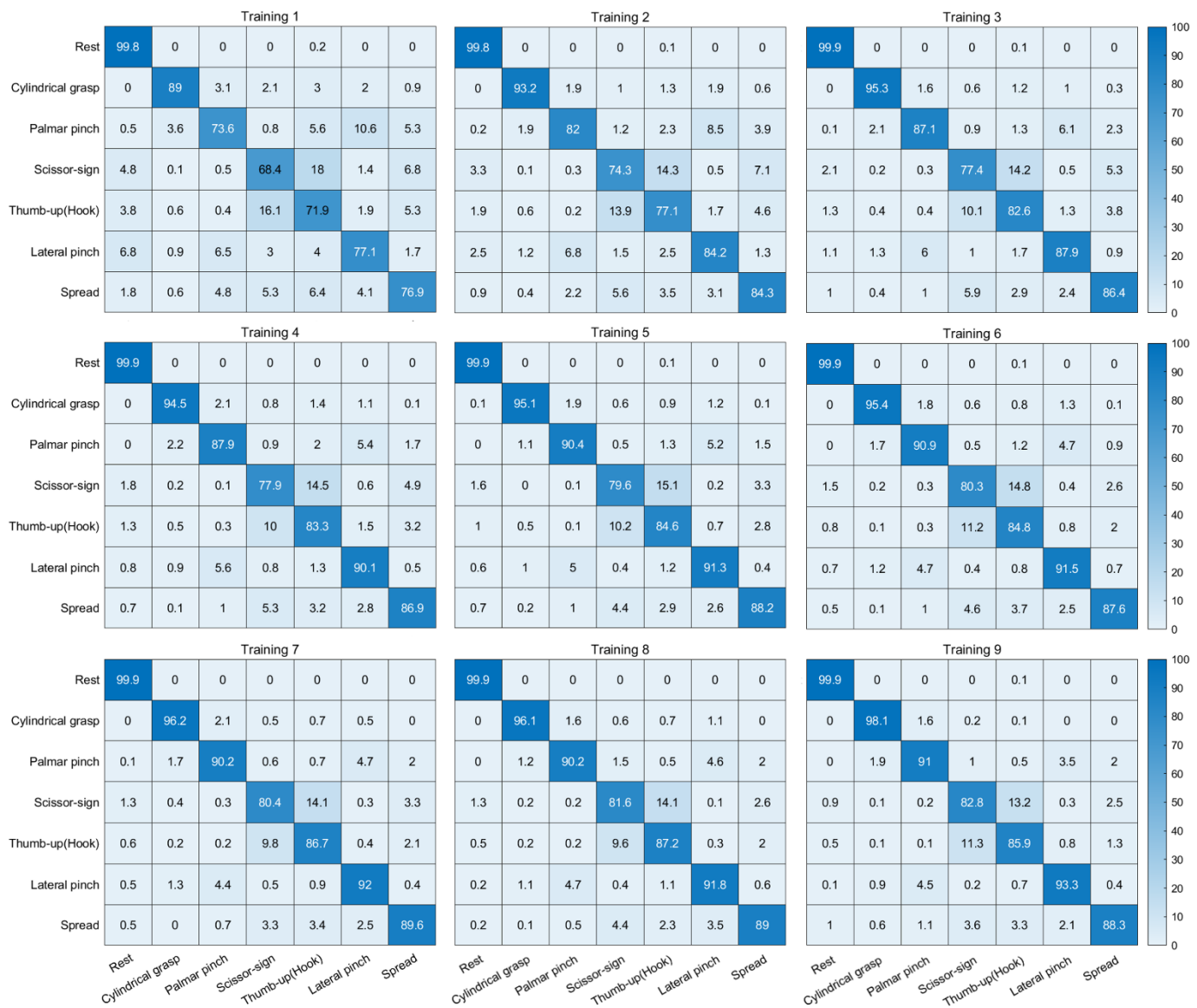


Figure S29. Confusion matrix of the hand postures of Group 5.

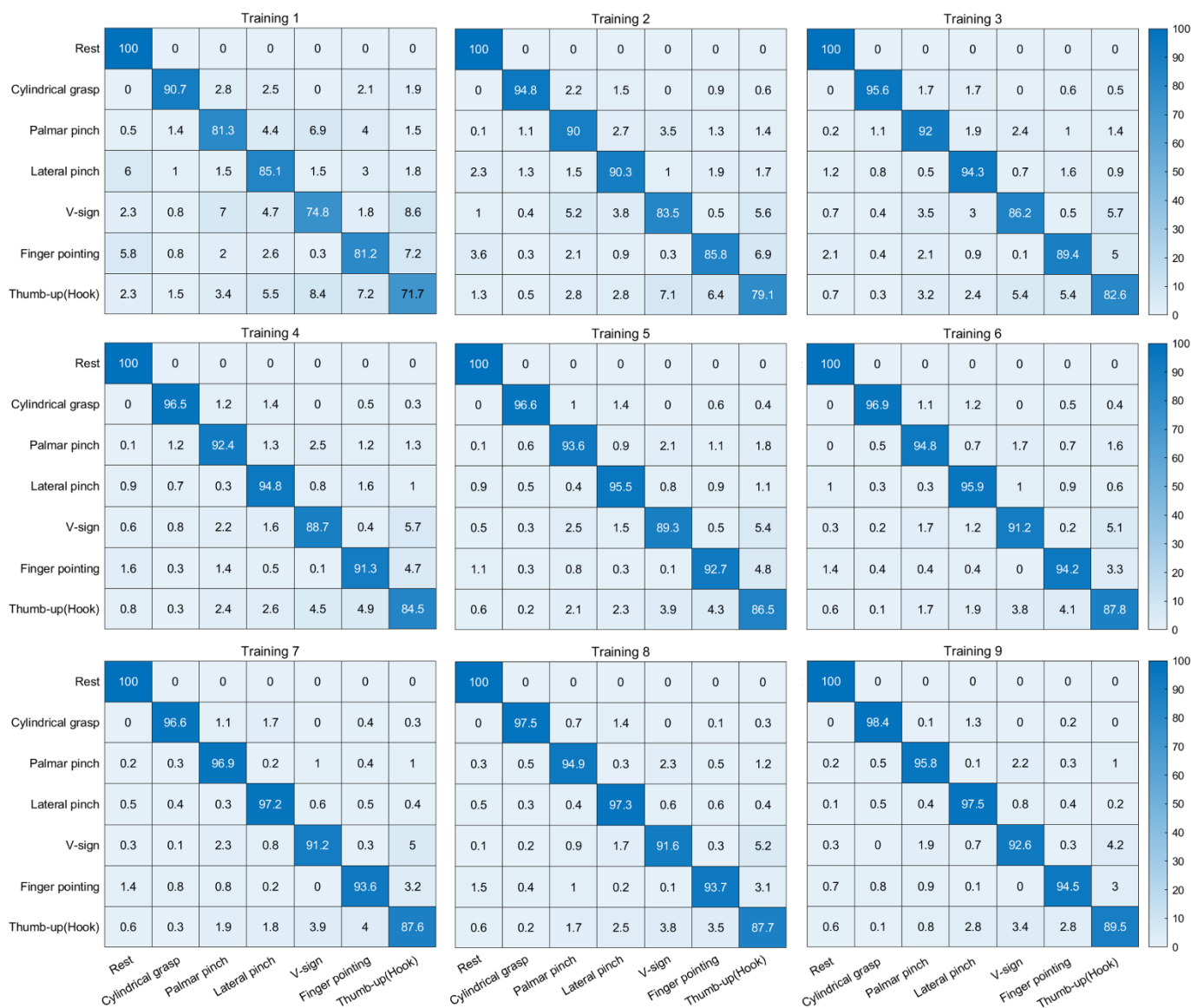


Figure S30. Confusion matrix of the hand postures of Group 6.

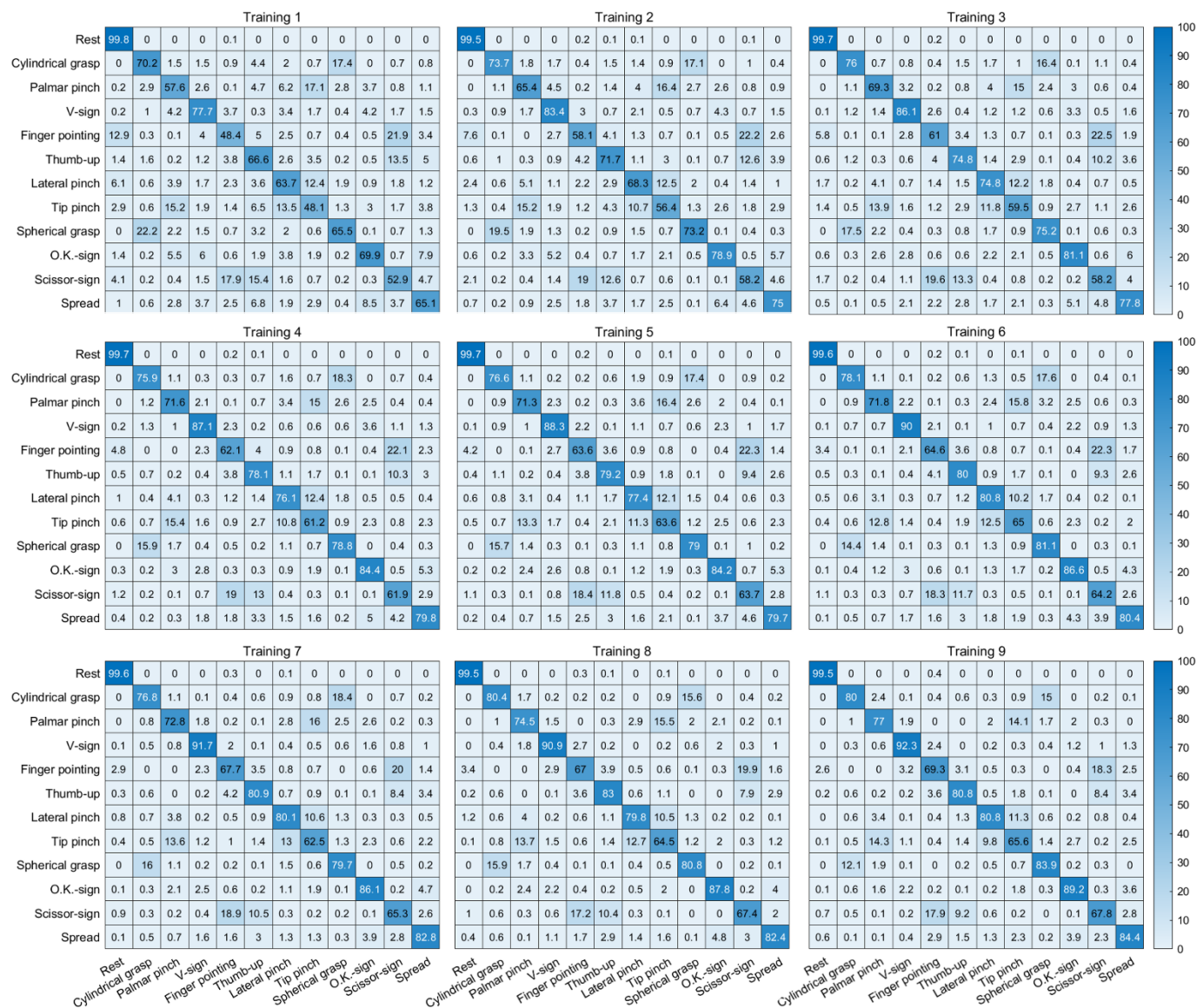


Figure S31. Confusion matrix of the hand postures of Group 7.