In the Name of God

General Test Conditions:

No. of Channels:	1 to 5	No. of Subjects:	109
–	–	Baseline Channel:	T10 (In case of use)
Task:	REO	No. of Epochs:	25(Ch1), 30(Ch2)
Orthogonal:	Yes (In case of use)	Tries:	3(Ch1), 5(Ch2)
Inner Shift:	4	Outer Shift:	8
Train Data Percentage:	50(Ch1), 80(Ch2)	Test Data Percentage:	25(Ch1), 20(ch2)

Overall Test Results:

Channels No.	Number of Tries	Previously Selected Channel(s)	Baseline	Orthog.	Best Channel	Train Data		Test Data	
						Loss	Acc.	Loss	Acc.
1	3	-	-	×	Oz (2 out of 3) (+)	0.4655	0.8514	0.5059	0.8352
					Oz (2 out of 3) (+)	0.4724	0.8487	0.5079	0.8338
2	3	Oz	-	✓	Fp1 (1 out of 5)(+)	0.0150	0.9960 ± 0.0022	0.0226	0.9929 ± 0.0033
					Fp1 (2 out of 5)(+)	0.0150	0.9960 ± 0.0022	0.0226	0.9929 ± 0.0033
	3	Oz	-	×	Fp1 (1 out of 5)(+)	0.0614	0.9829 ± 0.0048	0.0806	0.9755 ± 0.0063
					Fz (0 out of 5)(+)	0.0610	0.9812 ± 0.0096	0.0762	0.9758 ± 0.0102
3	3	Oz, –	-	✓	– (+)				
					– (+)				
	3	Oz, –	-	×	– (+)				
					– (+)				

Description:

Blue color: Best Channel according to the train accuracy.

Red color: Best Channel according to the test accuracy.

+: Link to the figures and tables in detail.

(BACK TO RESULT TABLE)

Test Conditions of Case 1: One Channel, Without Orthogonal

No. of Channels:	1	No. of Subjects:	109
Previous Selected Channels:	–	Baseline Channel:	–
Task:	REO	No. of Epochs:	25
Orthogonal:	No.	Tries:	3
Inner Shift:	4	Outer Shift:	8
Train Data Percentage:	50%	Test Data Percentage:	25%

Table 1: Avg. Results for Searching first best channel with 109 subjects, no baseline is removed. Channels are sorted due to the test data accuracy.

Channel	Train Data		Validation Data		Test Data	
	Loss	Acc.	Loss	Acc.	Loss	Acc.
P4,52	1.0402	0.6749	1.0848	0.6619	1.0916	0.6598
P3,48	0.9958	0.6864	1.0424	0.6734	1.0434	0.6708
Pz,50	0.9156	0.7207	0.9726	0.7029	0.9715	0.7021
F7,29	0.9033	0.7149	0.9488	0.7034	0.9472	0.7039
P8,54	0.9010	0.7197	0.9443	0.7059	0.9484	0.7056
Fp1,21	0.8695	0.7283	0.9234	0.7103	0.9251	0.7117
Cz,10	0.8564	0.7309	0.9083	0.7171	0.9093	0.7150
C3,8	0.8013	0.7504	0.8514	0.7357	0.8491	0.7352
Fp2,23	0.7990	0.7551	0.8465	0.7393	0.8429	0.7402
Fz,33	0.7587	0.7573	0.8083	0.7431	0.8037	0.7438
T8,41	0.7296	0.7615	0.7619	0.7513	0.7653	0.7493
P7,46	0.7243	0.7653	0.7658	0.7512	0.7685	0.7509
F3,31	0.7160	0.7695	0.7643	0.7542	0.7626	0.7540
F4,35	0.7146	0.7707	0.7539	0.7588	0.7578	0.7573
C4,12	0.7111	0.7783	0.7627	0.7608	0.7712	0.7586
T7,40	0.6517	0.7892	0.6894	0.7793	0.6893	0.7757
F8,36	0.6471	0.7958	0.6889	0.7832	0.6925	0.7802
O2,62	0.5575	0.8189	0.5895	0.8055	0.5958	0.8050
O1,60	0.5302	0.8252	0.5660	0.8137	0.5692	0.8105
Oz,61	0.4655	0.8514	0.5062	0.8362	0.5059	0.8352

Table 2: Best channels, in order, in each try.

		Try 1	Try 2	Try 3
B.C.	Train	***Oz***>O2>O1	***Oz***>O2>T7	O1>***Oz***>O2
	Test	***Oz***>O2>T7	***Oz***>O2>T7	O1>***Oz***>O2

Test Conditions of Case 1: (*continued*)

No. of Channels:	1	No. of Subjects:	109
Previous Selected Channels:	–	Baseline Channel:	–
Task:	REO	No. of Epochs:	25
Orthogonal:	No.	Tries:	3
Inner Shift:	4	Outer Shift:	8
Train Data Percentage:	50%	Test Data Percentage:	25%

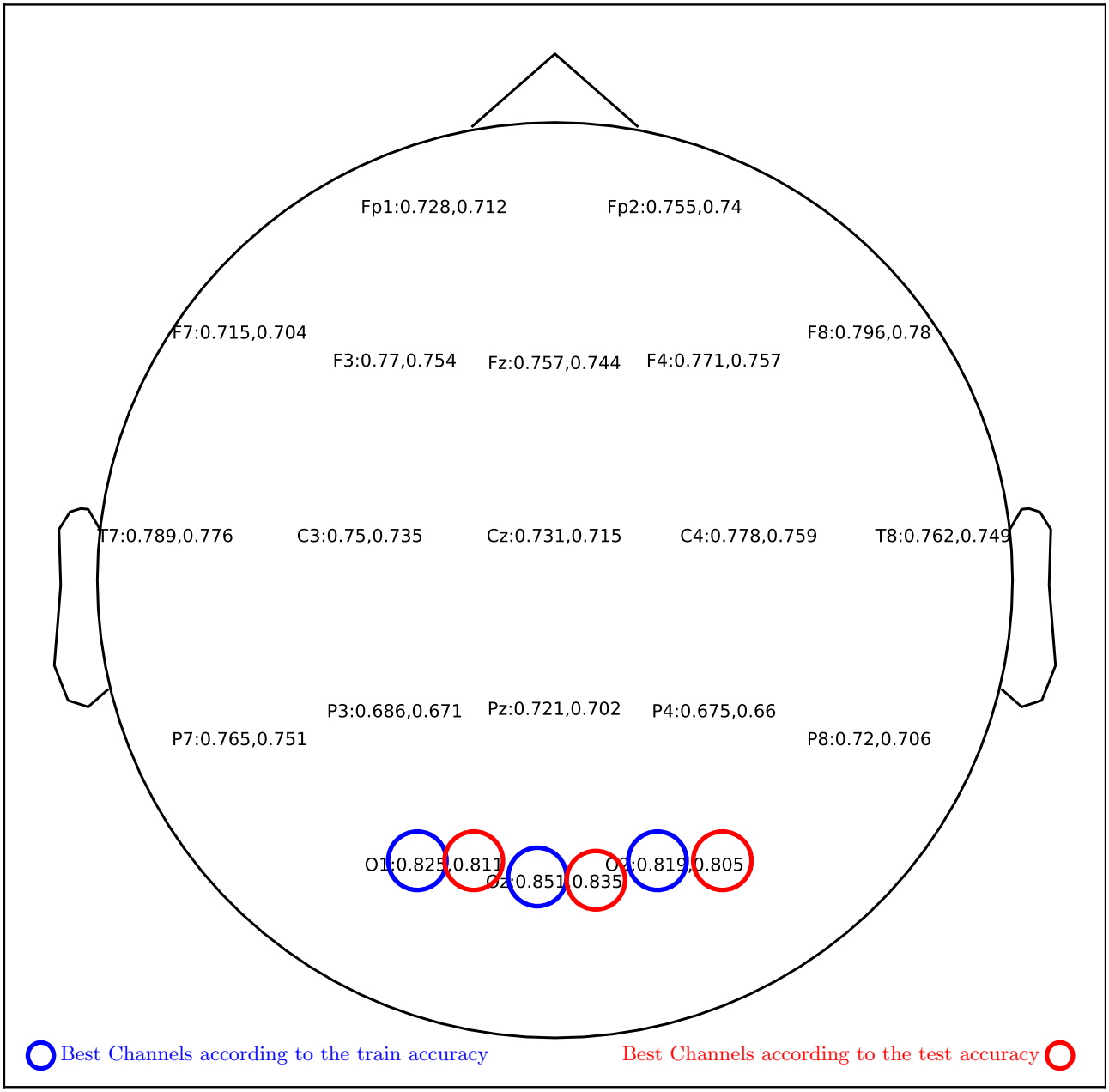

Figure 1: Avg. Results for Searching first best channel with 109 subjects, no baseline is removed.

(BACK TO RESULT TABLE)

Test Conditions of Case 2: Two Channels, With Orthogonal

No. of Channels:	2	No. of Subjects:	109
Previous Selected Channels:	Oz	Baseline Channel:	–
Task:	REO	No. of Epochs:	30
Orthogonal:	Yes	Tries:	5
Inner Shift:	4	Outer Shift:	8
Train Data Percentage:	80%	Test Data Percentage:	20%

Table 3: Avg. Results for Searching the second best channel with 109 subjects with orthogonalization. No baseline is removed. Channels are sorted due to the test data accuracy.

Channel	Train Data		Test Data	
	Loss	Acc.	Loss	Acc.
Oz,61	0.1000	0.0000 ± 0.0000	0.0000	0.0000 ± 0.0000
O1,60	0.0812	0.9747 ± 0.0323	0.0930	0.9710 ± 0.0335
F8,36	0.0456	0.9854 ± 0.0125	0.0600	0.9800 ± 0.0148
C3,8	0.0405	0.9869 ± 0.0063	0.0541	0.9814 ± 0.0074
C4,12	0.0422	0.9865 ± 0.0088	0.0545	0.9818 ± 0.0099
Fz,33	0.0378	0.9877 ± 0.0089	0.0484	0.9842 ± 0.0104
P3,48	0.0362	0.9886 ± 0.0119	0.0467	0.9848 ± 0.0141
Cz,10	0.0332	0.9894 ± 0.0071	0.0438	0.9852 ± 0.0084
O2,62	0.0341	0.9894 ± 0.0110	0.0431	0.9866 ± 0.0118
Fp2,23	0.0276	0.9914 ± 0.0039	0.0390	0.9869 ± 0.0049
P8,54	0.0285	0.9911 ± 0.0023	0.0378	0.9872 ± 0.0025
F7,29	0.0294	0.9911 ± 0.0081	0.0377	0.9877 ± 0.0086
Pz,50	0.0266	0.9920 ± 0.0037	0.0366	0.9882 ± 0.0052
F3,31	0.0273	0.9922 ± 0.0010	0.0361	0.9886 ± 0.0019
T7,40	0.0240	0.9934 ± 0.0028	0.0340	0.9893 ± 0.0040
F4,35	0.0231	0.9933 ± 0.0045	0.0328	0.9896 ± 0.0051
T8,41	0.0246	0.9926 ± 0.0031	0.0327	0.9897 ± 0.0028
P4,52	0.0209	0.9940 ± 0.0030	0.0302	0.9901 ± 0.0039
P7,46	0.0209	0.9944 ± 0.0041	0.0307	0.9907 ± 0.0055
Fp1,21	0.0150	0.9960 ± 0.0022	0.0226	0.9929 ± 0.0033

Table 4: Best channels, in order, in each try.

		Try 1	Try 2	Try 3	Try 4	Try 5
B.C.	Tr.	P7>T7>F7>P4>F4	T8>P4>O1>O2>Cz	P7>***Fp1***>F4>Cz>F7	Fz>***Fp1***>Cz>F7>Fp2	***Fp1***>P7>F4>Fz>C4
	Te.	P7>T7>F7>***Fp1***>P4	O1>P4>T8>O2>P3	***Fp1***>P7>F4>Cz>Pz	Fz>***Fp1***>Cz>F7>Fp2	***Fp1***>P7>Fz>O2>F4

Test Conditions of Case 2: (*continued*)

No. of Channels:	2	No. of Subjects:	109
Previous Selected Channels:	Oz	Baseline Channel:	–
Task:	REO	No. of Epochs:	30
Orthogonal:	Yes	Tries:	5
Inner Shift:	4	Outer Shift:	8
Train Data Percentage:	80%	Test Data Percentage:	20%

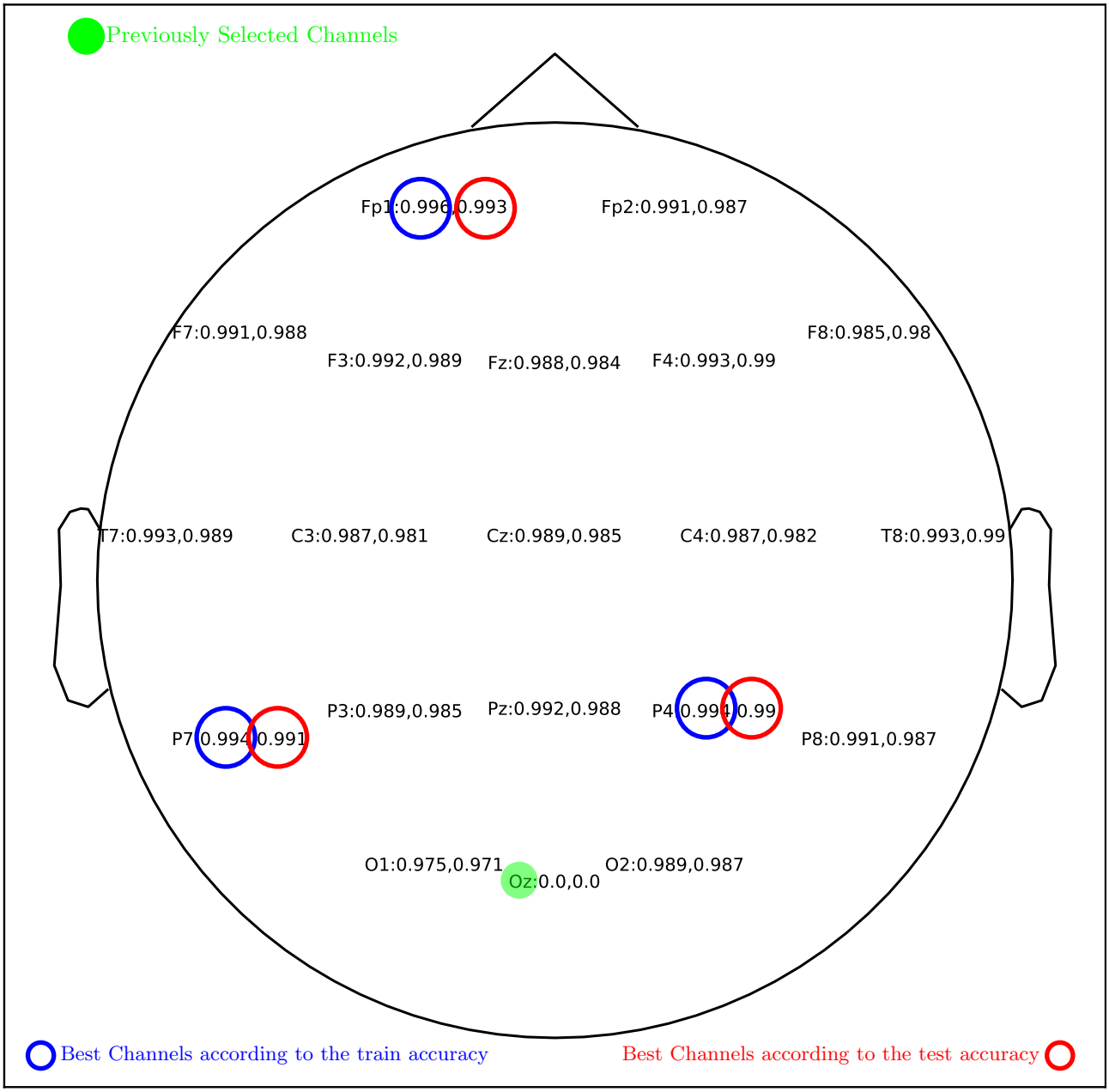

Figure 2: Avg. Results for Searching the second best channel with 109 subjects with orthogonalization. No baseline is removed.

(BACK TO RESULT TABLE)

Test Conditions of Case 3: Two Channels, Without Orthogonal

No. of Channels:	2	No. of Subjects:	109
Previous Selected Channels:	Oz	Baseline Channel:	–
Task:	REO	No. of Epochs:	30
Orthogonal:	No	Tries:	5
Inner Shift:	4	Outer Shift:	8
Train Data Percentage:	80%	Test Data Percentage:	20%

Table 5: Avg. Results for Searching the second best channel with 109 subjects without orthogonalization. No baseline is removed. Channels are sorted due to the test data accuracy.

Channel	Train Data		Test Data	
	Loss	Acc.	Loss	Acc.
Oz,61	0.1000	0.0000 ± 0.0000	0.0000	0.0000 ± 0.0000
P8,54	0.1458	0.9518 ± 0.0446	0.1693	0.9435 ± 0.0448
P3,48	0.1166	0.9624 ± 0.0277	0.1406	0.9541 ± 0.0283
Cz,10	0.1069	0.9650 ± 0.0242	0.1279	0.9569 ± 0.0258
F3,31	0.1038	0.9653 ± 0.0225	0.1241	0.9573 ± 0.0250
O1,60	0.0994	0.9671 ± 0.0195	0.1197	0.9590 ± 0.0201
Fp2,23	0.1003	0.9688 ± 0.0109	0.1263	0.9590 ± 0.0127
T8,41	0.0987	0.9695 ± 0.0249	0.1161	0.9629 ± 0.0271
Pz,50	0.0870	0.9731 ± 0.0102	0.1079	0.9646 ± 0.0109
T7,40	0.0825	0.9728 ± 0.0139	0.1012	0.9660 ± 0.0127
C3,8	0.0864	0.9738 ± 0.0122	0.1055	0.9664 ± 0.0132
P7,46	0.0800	0.9760 ± 0.0047	0.1025	0.9668 ± 0.0056
O2,62	0.0712	0.9775 ± 0.0093	0.0890	0.9704 ± 0.0097
C4,12	0.0762	0.9764 ± 0.0109	0.0940	0.9706 ± 0.0123
F7,29	0.0745	0.9785 ± 0.0020	0.0929	0.9710 ± 0.0038
P4,52	0.0650	0.9801 ± 0.0049	0.0866	0.9721 ± 0.0072
F8,36	0.0658	0.9797 ± 0.0106	0.0797	0.9737 ± 0.0110
F4,35	0.0622	0.9799 ± 0.0148	0.0777	0.9738 ± 0.0164
Fp1,21	0.0614	0.9829 ± 0.0048	0.0806	0.9755 ± 0.0063
Fz,33	0.0610	0.9812 ± 0.0096	0.0762	0.9758 ± 0.0102

Table 6: Best channels, in order, in each try.

		Try 1	Try 2	Try 3	Try 4	Try 5
B.C.	Tr.	O2>Fp1>F4>O1>P4	***Fz***>F4>F3>P4>F8	F4>F8>C3>***Fz***>CZ	T8>Cz>O2>O1>Fz	Fp1> F4>F3>P4>F8
	Te.	O2>Fp1>F4>O1>C4	F4>***Fz***>F3>P4>F8	F4>F8>***Fz***>C3>F7	T8>Cz>O2>***Fz***>O1	Fp1> ***Fz***>F3>P4>F8

Test Conditions of Case 2: (*continued*)

No. of Channels:	2	No. of Subjects:	109
Previous Selected Channels:	Oz	Baseline Channel:	–
Task:	REO	No. of Epochs:	30
Orthogonal:	No	Tries:	5
Inner Shift:	4	Outer Shift:	8
Train Data Percentage:	80%	Test Data Percentage:	20%

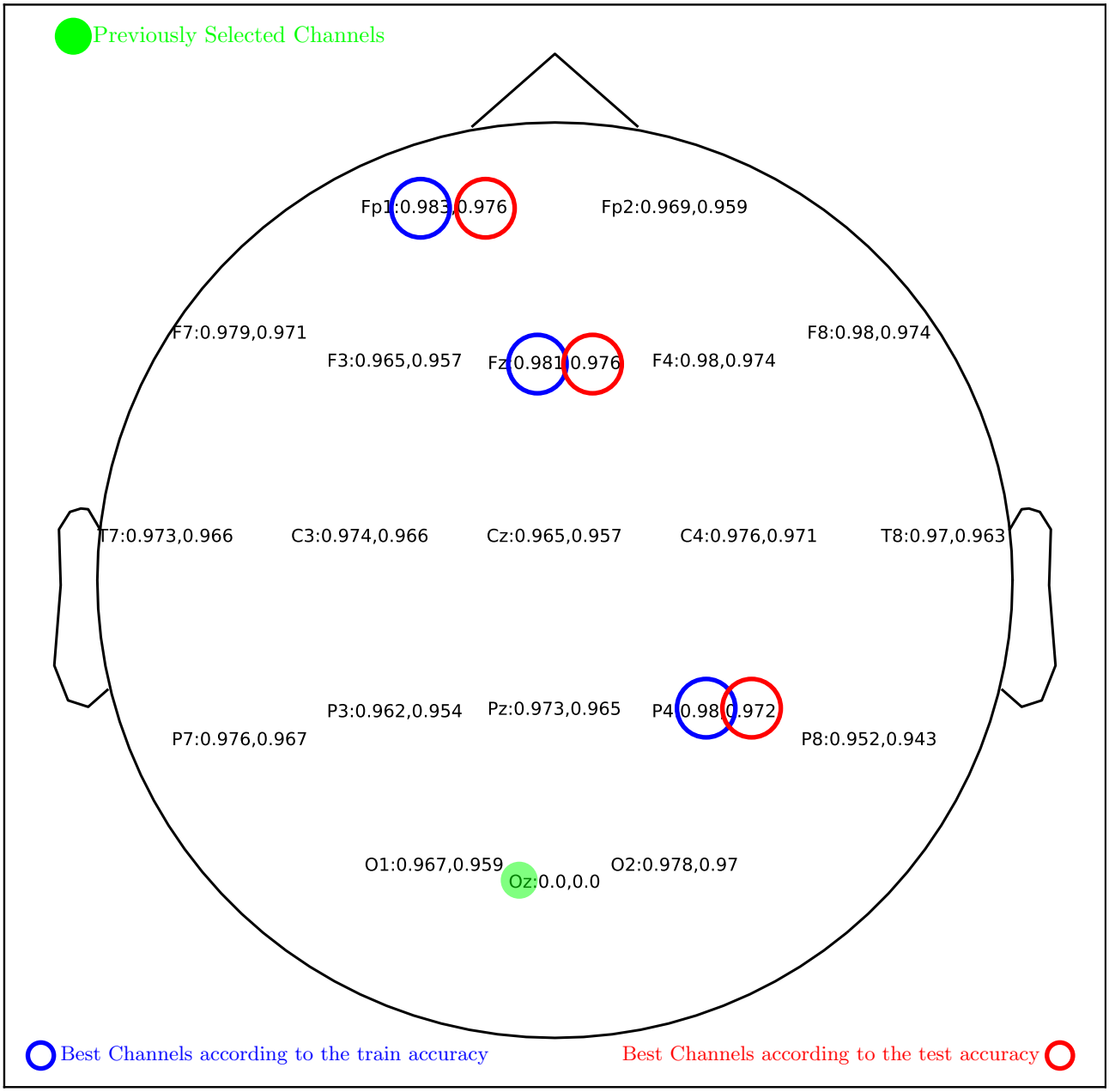

Figure 3: Avg. Results for Searching the second best channel with 109 subjects without orthogonalization. No baseline is removed.