

Table B1. Within-subject classification accuracy (%) of all 143 subjects across five public datasets (I–V) for comparative algorithms (CSP, CSSP, FBCSP, SBLEST, sCNN, dCNN, EEGNet, LMDA-Net, CSPNet, and CTSSP), with the highest accuracy for each subject highlighted in bold.												
Number	Dataset	Subject	CSP	CSSP	FBCSP	SBLEST	sCNN	dCNN	EEGNet	LMDA-Net	CSPNet	CTSSP
1	Dataset I (BNCI2014001)	1	87.6	91.3	91.3	90.2	87.6	85.0	90.1	87.0	89.3	93.1
2		2	57.6	59.2	59.7	68.7	60.9	53.8	54.8	54.3	62.1	73.9
3		3	96.7	96.6	94.9	96.4	98.1	97.7	98.5	96.7	98.0	98.0
4		4	76.5	79.3	73.5	82.8	77.8	52.6	56.4	67.9	82.1	83.3
5		5	57.8	68.1	84.0	75.5	66.0	60.2	57.1	53.7	83.7	82.8
6		6	75.0	75.4	68.1	82.7	66.2	51.7	53.0	55.1	74.0	80.0
7		7	84.9	87.9	88.1	88.8	87.8	70.8	62.8	83.9	89.5	91.2
8		8	97.3	98.0	97.3	97.6	98.6	86.2	97.5	97.6	97.8	99.2
9		9	85.0	84.7	85.9	87.2	91.8	84.6	89.4	90.1	89.3	91.8
10	Dataset II (Lee2019)	1	76.6	75.8	79.0	78.4	85.4	81.8	78.2	81.5	83.2	80.5
11		2	88.0	96.5	99.4	98.4	98.6	97.1	82.1	93.8	99.4	98.1
12		3	91.6	93.0	94.3	94.6	94.9	93.4	95.4	95.2	96.5	95.4
13		4	64.6	64.6	56.4	76.5	60.6	52.8	51.1	48.6	62.8	77.8
14		5	89.4	90.0	89.5	95.5	93.6	78.8	82.5	89.5	94.7	98.3
15		6	67.1	66.6	62.5	67.2	66.3	61.4	62.1	58.1	73.0	73.2
16		7	68.8	67.5	74.3	75.9	75.0	57.0	57.5	57.5	76.2	78.6
17		8	67.6	70.8	67.5	68.5	77.2	71.2	62.2	77.2	70.5	73.9
18		9	81.0	80.7	75.7	79.8	83.4	61.9	71.6	71.4	79.3	81.6
19		10	67.2	70.1	64.0	72.9	66.8	52.9	52.3	53.2	66.5	73.4
20		11	52.7	50.4	49.6	61.9	50.0	50.1	51.0	49.0	52.7	58.7
21		12	65.3	68.0	65.2	72.6	66.8	57.0	52.7	52.7	74.9	77.7
22		13	65.1	65.4	58.9	73.2	58.9	54.9	53.4	51.0	62.3	68.8
23		14	68.8	69.1	67.7	72.0	58.4	55.9	51.3	50.6	70.8	72.9
24		15	65.7	62.0	62.1	73.6	68.1	60.4	60.5	52.3	70.0	69.9
25		16	62.7	58.5	58.4	62.2	55.6	51.5	50.4	54.5	60.5	59.5
26		17	73.2	85.2	81.7	92.5	75.1	81.0	56.2	68.6	88.7	94.7
27		18	94.5	93.3	93.5	92.8	94.2	75.4	93.1	95.4	93.9	92.5
28		19	75.6	79.2	79.3	84.1	77.3	73.2	75.5	79.5	81.7	82.2
29		20	74.1	80.6	71.3	81.9	69.1	56.9	55.8	52.6	77.4	78.3
30		21	98.1	98.6	99.2	99.0	99.4	99.4	99.2	99.0	99.9	99.2
31		22	76.9	78.1	79.6	81.1	76.9	69.1	67.7	53.5	78.2	82.2
32		23	88.3	88.8	90.0	89.9	86.2	81.9	80.2	84.5	91.9	91.3
33		24	62.7	61.8	57.1	62.2	56.2	51.2	49.6	50.6	57.2	63.0
34		25	57.6	56.7	60.9	62.8	56.9	51.0	50.6	49.9	60.0	64.0
35		26	56.9	63.5	52.3	63.4	55.0	50.4	49.5	50.9	56.5	62.9
36		27	58.1	57.9	57.2	57.6	51.1	49.5	52.1	52.1	55.8	63.1
37		28	94.5	97.4	97.8	96.6	96.7	75.3	89.2	97.1	97.3	96.8
38		29	88.8	87.9	90.4	92.2	85.3	84.7	87.6	86.5	88.6	92.2
39		30	74.1	72.4	77.1	71.5	75.9	52.2	60.3	55.6	76.2	72.4
40		31	72.9	74.4	78.6	82.2	70.2	53.9	52.8	51.8	76.9	81.5
41		32	96.2	96.0	95.5	96.2	98.6	96.4	97.4	98.3	98.4	97.6
42		33	89.3	91.4	93.7	94.2	98.5	97.1	98.3	98.3	98.5	97.7
43		34	53.8	53.5	50.3	57.6	51.9	47.1	48.2	47.9	49.7	50.2
44		35	62.6	65.5	54.9	65.1	56.8	50.2	59.0	52.9	61.8	67.2
45		36	97.6	97.8	97.8	98.9	98.3	98.2	98.1	98.3	99.0	97.9
46		37	94.8	95.7	97.5	97.8	96.5	92.2	96.0	96.5	97.5	97.1
47		38	64.0	67.8	63.9	68.5	54.7	50.9	53.6	50.3	64.7	70.0
48		39	82.2	87.3	86.6	90.0	81.9	84.9	68.4	79.3	91.7	94.0
49		40	62.1	60.5	56.6	60.7	53.9	52.9	50.7	53.8	55.4	61.2
50		41	59.5	58.7	59.8	54.4	53.1	51.3	50.0	49.9	56.3	53.4
51		42	72.6	70.3	68.9	77.4	62.0	51.0	56.1	50.3	71.6	71.7
52		43	78.9	81.9	81.7	86.3	80.5	58.3	68.4	73.0	88.2	90.4
53		44	91.8	91.1	93.0	92.5	96.0	95.1	97.1	96.3	95.4	95.2
54		45	90.9	91.2	93.9	92.0	87.1	85.8	92.7	87.3	93.9	91.8
55		46	64.2	70.6	70.5	78.2	67.5	57.6	55.3	55.8	70.1	80.3
56		47	63.7	66.0	62.0	66.3	69.2	59.0	60.5	54.6	68.5	69.1
57		48	66.1	65.9	63.2	71.7	66.6	54.0	50.2	51.0	65.2	72.1
58		49	78.1	76.4	78.5	79.7	78.0	68.2	59.6	66.0	82.5	82.4
59		50	53.5	59.4	53.5	54.7	54.5	49.4	49.9	50.2	51.7	59.6
60		51	60.0	59.5	56.9	60.8	55.0	49.2	50.2	48.4	57.9	60.9
61		52	72.7	77.3	75.8	81.6	75.2	50.8	51.6	73.9	81.9	84.0
62		53	68.2	67.6	64.4	64.7	60.1	53.4	52.0	51.2	63.0	63.1
63		54	59.9	64.1	53.0	61.1	51.5	52.1	48.1	49.8	60.4	63.0
64	Dataset III (Pan2023)	1	82.3	81.9	87.5	89.8	91.9	85.1	81.2	77.1	92.8	93.5
65		2	54.5	53.2	55.9	56.3	54.6	50.3	50.3	52.0	59.2	62.2
66		3	71.0	72.3	60.1	73.4	62.3	57.5	57.0	52.8	71.1	72.5
67		4	74.8	79.8	68.9	85.8	70.3	73.3	61.4	54.0	78.7	85.9
68		5	66.5	66.2	80.8	74.1	82.9	56.1	70.7	54.5	79.9	76.6
69		6	59.9	63.2	62.7	69.8	55.0	49.2	52.0	50.7	64.4	69.1
70		7	56.6	53.3	52.9	56.8	56.2	49.9	48.7	49.2	56.6	59.0
71		8	76.6	82.2	87.4	86.8	83.5	84.7	68.7	66.3	89.4	91.8
72		9	65.2	64.2	61.5	57.8	70.7	50.9	75.2	61.2	69.1	74.4
73		10	59.7	67.0	61.6	70.2	63.6	55.8	56.4	52.8	68.1	68.2
74		11	63.8	67.9	55.6	70.8	59.5	55.4	52.3	51.0	61.3	70.5
75		12	67.0	70.2	76.8	70.5	69.8	53.8	64.3	53.8	69.9	75.1
76		13	73.9	74.9	81.8	85.8	85.2	76.3	74.7	71.9	86.5	90.9
77		14	66.7	69.2	68.7	74.0	74.2	52.6	58.6	67.3	73.0	78.7
78	Dataset IV (BNCI2014002)	1	72.8	74.5	74.4	74.5	58.4	57.9	63.3	50.0	80.9	77.9
79		2	82.6	80.1	79.4	83.3	68.6	69.3	83.1	79.5	84.5	83.4
80		3	99.4	100.0	100.0	100.0	83.4	58.1	89.9	99.9	100.0	100.0
81		4	86.6	88.0	90.0	87.5	81.9	61.1	85.9	90.8	92.4	89.4
82		5	75.5	82.9	82.6	87.1	64.8	52.4	71.0	72.5	85.0	86.4
83		6	78.8	79.9	74.8	80.1	60.9	52.5	66.1	52.5	73.9	80.6
84		7	89.0	89.9	87.5	85.8	80.0	60.1	77.4	90.6	92.8	91.9
85		8	81.4	82.9	90.3	91.3	81.6	85.9	84.8	93.1	93.1	93.8
86		9	89.9	87.9	89.4	92.3	85.0	85.9	92.5	91.8	95.3	95.6
87		10	66.6	73.9	66.5	73.6	61.9	50.9	59.1	54.8	70.0	75.8
88		11	84.3	84.3	84.1	84.8	73.5	54.9	78.3	82.8	87.0	87.6
89		12	76.8	74.8	80.5	75.6	57.4	54.4	57.4	55.4	82.4	80.0
90		13	64.6	69.0	64.1	68.3	55.8	50.9	50.8	50.9	60.4	68.4
91		14	58.6	58.8	55.8	60.9	53.9	50.5	51.6	51.8	57.4	59.9
92	Dataset V (Cho2017)	1	77.8	78.9	76.3	82.3	84.9	64.2	83.0	52.2	76.3	88.6
93		2	44.6	43.4	54.3	55.1	46.8	49.6	50.4	49.2	50.7	51.3
94		3	80.3	83.7	82.7	87.8	96.0	91.7	95.4	95.2	84.0	98.0
95		4	79.9	81.1	85.9	78.9	88.7	68.9	85.7	88.4	81.4	90.3
96		5	63.0	61.2	57.2	71.0	63.1	57.8	51.2	49.6	59.7	76.3
97		6	60.2	60.9	64.3	60.5	67.6	52.0	53.6	52.5	64.7	64.7
98		7	51.5	52.3	47.9	57.5	52.5	50.9	48.8	50.8	51.3	60.3
99		8	47.3	49.2	45.5	49.7	51.1	49.6	51.5	49.1	46.4	48.4

Table B2. Cross-session classification accuracy (%) of all 77 subjects across three public datasets (I–III) for comparative algorithms (CSP, CSSP, FBCSP, SBLEST, sCNN, dCNN, EEGNet, LMDA-Net, CSPNet, and CTSSP), with the highest accuracy for each subject highlighted in bold.												
Number	Dataset	Subject	CSP	CSSP	FBCSP	SBLEST	sCNN	dCNN	EEGNet	LMDA-Net	CSPNet	CTSSP
1	Dataset I (BNCI2014001)	1	80.6	86.1	89.6	89.6	82.6	50.0	74.3	74.3	84.7	95.1
2		2	47.9	52.1	53.5	54.9	56.9	47.2	52.8	54.2	61.1	68.1
3		3	94.4	91.0	93.1	97.9	96.5	99.3	99.3	87.5	95.1	95.1
4		4	72.2	72.9	64.6	75.7	69.4	50.0	47.9	54.9	70.8	84.7
5		5	50.0	63.2	77.8	69.4	56.3	51.4	52.1	57.6	76.4	70.1
6		6	70.1	73.6	62.5	75.0	54.9	56.9	55.6	53.5	58.3	77.1
7		7	59.0	81.9	84.7	76.4	56.3	54.2	58.3	50.7	60.4	78.5
8		8	97.2	96.5	92.4	95.8	99.3	50.7	96.5	87.5	91.0	98.6
9		9	84.0	87.5	84.0	78.5	91.0	84.7	89.6	86.1	88.2	82.6
10	Dataset II (Lee2019)	1	52.0	61.0	81.0	71.0	58.0	60.0	55.0	50.0	68.0	81.0
11		2	51.0	61.0	86.0	80.0	50.0	50.0	48.0	46.0	78.0	84.0
12		3	92.0	96.0	84.0	89.0	92.0	92.0	95.0	93.0	94.0	94.0
13		4	50.0	50.0	50.0	49.0	52.0	50.0	49.0	56.0	56.0	50.0
14		5	72.0	64.0	80.0	92.0	58.0	49.0	60.0	52.0	67.0	80.0
15		6	58.0	57.0	49.0	54.0	59.0	54.0	51.0	51.0	64.0	75.0
16		7	71.0	69.0	70.0	65.0	60.0	53.0	51.0	47.0	55.0	79.0
17		8	62.0	58.0	57.0	66.0	49.0	50.0	51.0	52.0	46.0	62.0
18		9	62.0	62.0	66.0	64.0	63.0	58.0	51.0	50.0	66.0	85.0
19		10	56.0	53.0	53.0	52.0	55.0	50.0	70.0	50.0	62.0	54.0
20		11	49.0	51.0	47.0	49.0	51.0	51.0	46.0	58.0	51.0	49.0
21		12	55.0	45.0	59.0	56.0	54.0	46.0	52.0	54.0	52.0	63.0
22		13	50.0	50.0	51.0	50.0	55.0	50.0	51.0	50.0	49.0	50.0
23		14	58.0	55.0	67.0	57.0	55.0	53.0	52.0	50.0	63.0	58.0
24		15	51.0	50.0	57.0	53.0	42.0	47.0	58.0	54.0	51.0	53.0
25		16	63.0	53.0	50.0	54.0	49.0	40.0	49.0	43.0	54.0	52.0
26		17	57.0	55.0	54.0	60.0	58.0	49.0	51.0	50.0	61.0	53.0
27		18	67.0	87.0	71.0	63.0	75.0	41.0	51.0	73.0	76.0	73.0
28		19	79.0	80.0	71.0	80.0	65.0	50.0	58.0	70.0	71.0	84.0
29		20	72.0	69.0	53.0	66.0	55.0	52.0	53.0	50.0	61.0	61.0
30		21	91.0	98.0	89.0	100.0	94.0	50.0	46.0	92.0	75.0	99.0
31		22	57.0	70.0	55.0	53.0	66.0	58.0	46.0	52.0	61.0	53.0
32		23	85.0	84.0	75.0	84.0	59.0	46.0	49.0	66.0	68.0	87.0
33		24	59.0	52.0	57.0	57.0	47.0	46.0	59.0	50.0	51.0	62.0
34		25	56.0	52.0	62.0	54.0	49.0	51.0	51.0	50.0	55.0	53.0
35		26	56.0	60.0	55.0	44.0	53.0	46.0	59.0	52.0	50.0	55.0
36		27	48.0	50.0	55.0	49.0	53.0	46.0	54.0	50.0	47.0	46.0
37		28	63.0	86.0	86.0	72.0	66.0	52.0	50.0	93.0	83.0	53.0
38		29	96.0	95.0	89.0	82.0	91.0	95.0	98.0	91.0	93.0	92.0
39		30	69.0	71.0	69.0	59.0	56.0	44.0	51.0	50.0	59.0	64.0
40		31	51.0	50.0	80.0	68.0	61.0	43.0	48.0	52.0	62.0	60.0
41		32	94.0	94.0	92.0	92.0	97.0	94.0	97.0	93.0	93.0	98.0
42		33	88.0	94.0	94.0	87.0	95.0	83.0	93.0	92.0	88.0	92.0
43		34	53.0	49.0	53.0	50.0	49.0	50.0	53.0	51.0	51.0	49.0
44		35	50.0	51.0	50.0	51.0	48.0	49.0	74.0	44.0	59.0	51.0
45		36	100.0	100.0	100.0	99.0	100.0	94.0	65.0	100.0	99.0	98.0
46		37	81.0	81.0	85.0	90.0	90.0	73.0	84.0	85.0	74.0	97.0
47		38	62.0	58.0	59.0	51.0	49.0	54.0	51.0	48.0	56.0	60.0
48		39	70.0	83.0	74.0	78.0	69.0	53.0	48.0	50.0	75.0	82.0
49		40	65.0	50.0	47.0	48.0	51.0	51.0	52.0	50.0	52.0	52.0
50		41	51.0	50.0	62.0	48.0	54.0	53.0	48.0	59.0	50.0	45.0
51		42	65.0	69.0	58.0	70.0	42.0	51.0	58.0	47.0	68.0	68.0
52		43	56.0	64.0	64.0	64.0	60.0	54.0	41.0	70.0	67.0	70.0
53		44	97.0	88.0	96.0	74.0	89.0	54.0	97.0	89.0	93.0	88.0
54		45	94.0	77.0	83.0	94.0	78.0	68.0	47.0	50.0	90.0	91.0
55		46	62.0	59.0	70.0	80.0	60.0	50.0	48.0	50.0	65.0	70.0
56		47	71.0	56.0	60.0	54.0	53.0	50.0	48.0	48.0	55.0	52.0
57		48	55.0	50.0	55.0	57.0	52.0	55.0	48.0	50.0	47.0	58.0
58		49	51.0	53.0	61.0	50.0	56.0	56.0	57.0	58.0	65.0	50.0
59		50	50.0	50.0	52.0	52.0	51.0	56.0	51.0	50.0	46.0	55.0
60		51	53.0	60.0	55.0	53.0	52.0	47.0	52.0	50.0	48.0	59.0
61		52	74.0	69.0	76.0	78.0	57.0	68.0	52.0	51.0	63.0	86.0
62		53	73.0	71.0	54.0	73.0	52.0	50.0	52.0	49.0	53.0	65.0
63		54	51.0	52.0	53.0	53.0	53.0	52.0	54.0	49.0	55.0	56.0
64	Dataset III (Pan2023)	1	51.7	60.0	80.8	71.7	64.2	52.5	86.7	50.8	76.7	73.3
65		2	50.8	46.7	50.0	49.2	50.0	50.8	49.2	52.5	60.0	50.0
66		3	72.5	60.8	45.8	68.3	52.5	44.2	40.8	50.0	58.3	70.8
67		4	58.3	56.7	51.7	60.0	46.7	51.7	50.8	50.0	53.3	63.3
68		5	50.0	64.2	77.5	55.0	50.0	55.0	50.0	50.8	66.7	62.5
69		6	50.0	56.7	50.0	67.5	50.0	50.0	41.7	44.2	50.8	62.5
70		7	50.0	49.2	50.8	51.7	57.5	50.0	50.8	50.0	52.5	56.7
71		8	76.7	60.8	80.0	85.0	55.0	53.3	44.2	50.0	61.7	89.2
72		9	50.0	48.3	58.3	57.5	50.8	45.0	60.0	60.8	65.0	65.8
73		10	51.7	55.0	48.3	51.7	56.7	49.2	50.0	52.5	50.8	64.2
74		11	58.3	52.5	53.3	62.5	50.0	50.0	51.7	56.7	55.0	57.5
75		12	57.5	56.7	71.7	61.7	58.3	46.7	58.3	50.0	52.5	71.7
76		13	56.7	60.8	58.3	60.8	60.0	52.5	58.3	56.7	57.5	54.2
77		14	50.0	58.3	57.5	50.0	53.3	50.0	55.0	52.5	53.3	50.8
Mean			64.5	65.1	66.5	66.3	61.4	55.0	57.9	58.6	64.4	68.8
SD			15.0	15.4	15.0	15.2	15.2	12.9	15.2	15.1	14.1	16.0