BCI Competition III - Organizers

[Berlin]
Benjamin Blankertz, Guido Dornhege, Klaus-Robert Müller

[Albany]
Gerwin Schalk, Dean Krusienski, Jonathan R. Wolpaw

[Graz]
Alois Schlögl, Bernhard Graimann, Gert Pfurtscheller

[Martigny]
Silvia Chiappa, José del R. Millán

[Tübingen]
**Michael Schröder, Thilo Hinterberger, Thomas Navin Lal,
Guido Widman, Niels Birbaumer**

Data Set I – Tübingen

»motor imagery in ECoG recordings, session-to-session transfer«

Perf: **accuracy** [%], Chance: 50%, submissions: 27

#.	contributor	acc	research lab	co-contributors
1.	Qingguo Wei	91	Tsinghua University, Beijing	Fei Meng, Yijun Wang, Shangkai Gao
2.	Paul Hammon	87	University of California, San Diego	
3.	Michal Sapinski	86	No affiliation, Poland	
3.	Mao Dawei	86	Zhejiang University, P.R.C.	Ke Daguan, Xie Mingqiang, Ding Jichang, Zheng Kening, Zhou Jie, Murat
3.	Alexander D'yakonov	86	Moscow State University	
3.	Liu Yang	86	National University of Defense Technology Changsha, P.R.C.	Hu Dewen, Zhou Zongtan, Zang Guohua
7.	Florian Knoll	84	TU Graz	Alois Schloegl, Martin Hieden, Carmen Vidaurre, Bernhard Graimann
7.	Zhou Zongtan	84	National University of Defense Technology Changsha, P.R.C.	Liu Yang, Hu Dewen
9.	Jianzhao Qin	83	South China University of Technology, China and Institute for Infocomm Research, Singapore	Yuanqing Li
10.	Matthias Krauledat	82	Fraunhofer FIRST, Berlin	

11.	Kiyoung Yang	**81**	University of Southern California	
11.	Martin Hieden	**81**	TU Graz, Austria	Florian Knoll, Alois Schloegl, Carmen Vidaurre, Bernhard Graiman
13.	Archis Gore	**79**	Fergusson College, Pune	
13.	Elly Gysels	**79**	CSEM, Neuchatel	
15.	Xiaomei Pei	**69**	Xi'an Jiaotong University, P.R.C.	Guangyu Bin
16.	Ehsan Arbabi	**67**	Sharif University of Technology, Tehran	Mohammad Bagher Shamsollahi
17.	Florian Popescu	**66**	Fraunhofer FIRST, Berlin	
18.	Hyunjin Yoon	**65**	University of Southern California	
18.	Guido Nolte	**65**	Fraunhofer FIRST	
20.	Timothy Uy	**60**	University of California, Irvine (?)	
21.	Wit Jakuczun	**59**	Warsaw University of Technology	
22.	Ken Wong	**58**	Stanford University	
23.	Xi-Chen Sun	**54**	Peking University	Jufu Feng, Lianwen Wu, Qiansheng Cheng
24.	Nanying Liang	**50**	Nanyang Technological University, Singapore	
25.	Bin An	**48**	University of Science and Technology of China, Hefei	Yan Ning, Qiang Chen, Zhaohui Jiang, Huanqing Feng
26.	Miharu Nishino	**44**	Univ. of Tokyo	Osamu Fukayama, Takashi Sato
27.	Yan Ning	**22**	University of Science and Technology of China, Hefei	Bin An, Qiang Chen, Zhaohui Jiang, Huanqing Feng

Data Set II − Albany

»P300 speller paradigm«

Perf: **accuracy** [%] using all 15 repetitions, chance: 2.8%, 10 submissions

#.	contributor	acc	acc5	research lab	co-contributors
1.	Alain Rokotomamonj	**96.5**	73.5	PSI CNRS FRE-2645, INSA de Rouen, France	V. Guigue
2.	Li Yandong	**90.5**	55.0	Department of Automation Department of Biomedical Engineering, Tsinghua University, China	Gao Xiaorong, Ma Zhongwei, Lin Zhonglin, Lu Wenkai, Hong Bo
3.	Zhou Zongtan	**90.0**	59.5	Department of Automatic Control, National University of Defense Technology, China	Liu Yang, Hu Dewen, Zang Guohu
4.	Ulrich Hoffmann	**89.5**	53.0	Signal Processing Institute, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland	
5.	Lin Zhonglin	**87.5**	57.5	Department of Automation, Tsinghua University, China	Zhang Changshui, Gao Xiaorong, Zhou Jieyun
6.	Renzhi Lu	**83.0**	54.5	Rensselaer Polytechnic Institute, NY	
7.	Gerardo Gentiletti	**78.5**	46.0	Neuroimaging Laboratory, Department of Electrical Engineering, Universidad Autonoma Metropolitana Iztapalapa, Mexico City	Oscar Suarez, Veronica Banuelos

8.	Gautam Kunapuli	**75.0**	34.0	Rensselaer Polytechnic Institute, NY	
9.	Qi Hongzhi	**33.5**	27.5	Tianjin University, China	Zhang Qian, Wang Zhen, Wan Baikun
10.	Kiyoung Yang	**7.5**	7.0	University of Southern California	Cyrus Shahabi, Hyunjin Yoon

Data Set IIIa – Graz

»motor imagery, multi-class, good vs. fair subject performance«

Perf: **kappa** (scaled accuracy with *#classes*), chance: 0, submissions: 3

#.	contributor	kappa	K3	K6	L1	research lab	co-contributors
1.	Cuntai Guan	**0.79**	0.82	0.76	0.80	Neural Signal Processing Lab Institute for Infocomm Research, Singapore	Haihong Zhang, Yuanqin Li
2.	Gao Xiaorong	**0.69**	0.90	0.43	0.71	Tsinghua University, Beijing, China	Wu Wei, Wang Ruiping, Yang Fusheng
3.	Jeremy Hill	**0.63**	0.95	0.41	0.52	Max Planck Institute for Biological Cybernetics, Tuebingen and Tuebingen University	Michael Schroeder

Data Set IIIb – Graz

»motor imagery with non-stationarity problem«

Perf: **MI/t** (max. steepness of mutual information), chance: 0, submissions: 7

#.	contributor	MI/t	O3	S4	X11	research lab	co-contributors
1.	S. Lemm	**0.32**	0.17	0.44	0.35	Fraunhofer (FIRST) IDA, Berlin Germany	
2.	O. Burmeister	**0.25**	0.16	0.42	0.17	Forschungszentrum Karlsruhe, Germany	M. Reischl, R. Mikut
3.	Xiaomei Pei	**0.14**	0.20	0.09	0.12	Institute of Biomedical Engineering of Xian Jiaotong University, Xian, China	Guangyu Bin
4.	S. Parini	**0.12**	0.12	0.12	0.12	Politecnico di Milano, Italy	L. Piccini, L. Maggi, G. Panfili, G. Andreoni
5.	D. Coyle	**0.12**	0.10	0.15	0.09	University of Ulster, Northern Ireland	G. Prasad, M. McGinnity
6.	Dezhong Yao	**0.11**	0.12	0.15	0.06	University of Electronic Science and Technology of China (UESTC) Chengdu, China	Yu Yin, Xiang Liao
7.	K. Tavakolian	**0.05**	0.07	0.02	0.05	University of Northern British Columbia, Canada	S. Rezaei

Data Set IVa – Berlin

»motor imagery, small training sets«

Perf: overall **accuracy** [%], chance: 50%, submissions: 14

#.	contributor	acc	aa	al	av	aw	ay	research lab	co-contributors
1.	Yijun Wang	**94.2**	96	100	81	100	98	Tsinghua University, Beijing	Han Yuan, Dan Zhang, Xiaorong Gao, Zhiguang Zhang, Shangkai Gao
2.	Yuanqing Li	**85.1**	89	98	76	92	81	Institute for Infocomm Research, Singapore	Xiaoyuan Zhu, Cuntai Guan
3.	Liu Yang	**83.5**	82	95	70	88	88	National University of Defense Technology, Changsha, Hunan	Zhou Zongtan, Zang Guohua, Hu Dewen
4.	Zhou Zongtan	**72.6**	84	100	63	51	88	National University of Defense Technology, Changsha, Hunan	Hu Dewen, Liu Yang
5.	Michael Bensch	**69.2**	73	96	70	80	51	University of Tuebingen and Max Planck Institute for Biological Cybernetics	Jeremy Hill
6.	Lehembre Remy	**68.6**	83	91	50	88	54	Université Catholique de Louvain-la-Neuve (UCL-Belgium)	Cedric Simon

7.	Elly Gysels	**67.9**	70	96	64	70	62	Swiss Center for Electronics and Microtechnology, Neuchatel, Switzerland	
8.	Carmen Viduarre	**64.0**	66	93	67	68	50	Dp IEE, State University of Navarra (UPNA) / Institut for Human-Computer Interfaces/BCI Lab, TU Graz	Alois Schloegl, Martin Hieden, Florian Knoll, Rafael Cabeza
9.	Le Song	**63.7**	66	100	63	64	54	NICTA and School of Information Technology	
10.	Ehsan Arbabi	**62.7**	70	95	56	64	56	Electrical Engineering Department, Sharif University of Technology, Tehran, Iran	Emad Fatemizadeh
11.	Cyrus Shahabi	**59.5**	57	77	58	64	54	University of Southern California	Kiyoung Yang, Hyunjin Yoon
12.	Kiyoung Yang	**53.9**	53	86	61	52	44	University of Southern California	Hyunjin Yoon, Cyrus Shahabi
13.	Wang Feng	**51.9**	51	54	55	56	46	Southeast University, Nanjing	Liu Jianmin, Gong Kainan, Wang Xiaonan, Tang Liyan
14.	Hyunjin Yoon	**51.2**	50	68	53	53	46	University of Southern California	Kiyoung Yang, Cyrus Shahabi

Data Set IVc – Berlin

»motor imagery, rest class in test, but not in training data«

Perf: **mean square error (mse)**, constant 0 output: $0.\bar{6}$, submissions: 7

#.	contributor	mse	research lab	co-contributors
1.	Dan Zhang	**0.30**	Department of Biomedical Enginee-ring, Tsinghua University, Beijing	Yijun Wang
2.	Liu Yang	**0.59**	National University of Defense Technology, Changsha, Hunan	Hu Dewen, Zhou Zongtan, Zang Guo-hua
3.	Zhou Zongtan	**0.60**	National University of Defense Technology, Changsha, Hunan	Hu Dewen, Liu Yang
4.	Bo Hong	**0.67**	Johns Hopkins School of Medicine	Soumyadipta Acharya, Nitish V. Thakor
5.	Kiyoung Yang	**0.74**	Information Laboratory, University of Southern California	Hyunjin Yoon, Cyrus Shahabi
6.	Cyrus Shahabi	**0.88**	Information Laboratory, University of Southern California	Kiyoung Yang, Hyunjin Yoon
7.	Hyunjin Yoon	**1.33**	Information Laboratory, University of Southern California	Kiyoung Yang, Cyrus Shahabi

Data Set V – Martigny

»mental imagery, multi-class, uncued classifier application«

Perf: **accuracy** [%], chance: $33.\bar{3}$%, submissions: 19

#.	contributor	psd	acc	s1	s2	s3	research lab	co-contributors
1.	Ferran Galan	y	**68.7**	80	70	56	University of Barcelona	Francesc Oliva, Joan Guardia
2.	Xiang Liao	y	**68.5**	78	72	56	University of Electronic Science and Technology of China (UESTC)	Yu Yin, Dezhong Yao
3.	Walter	y	**65.9**	78	66	53	???	
4.	Xiaomei Pei	y	**65.7**	76	69	52	Institute of Biomedical Engineering of Xi'an Jiaotong University	Guangyu Bin, Chongxun Zheng
5.	Irene Sturm	y	**64.9**	78	64	53	Fraunhofer FIRST (IDA), Berlin	Guido Dornhege
6.	Stephan Uray	y	**64.6**	81	73	40	TU Graz	
7.	Julien Kronegg	y	**64.0**	76	65	51	University of Geneva	Douglas Rofes
8.	John Q. Gan	y	**63.9**	77	64	50	University of Essex, Colchester	Louis C.S. Tsui
9.	Shiliang Sun	n	**62.8**	74	62	52	Tsinghua University, Beijing	Changshui Zhang, Jie Pan
10.	J. I. Serrano	y	**62.6**	76	62	50	Instituto de Automatica Industrial. CSIC. Madrid	
11.	Changshui Zhang	y	**60.5**	72	59	50	Tsinghua University, Beijing	Shiliang Sun, Feiping Nie

12.	Douglas Rofes	y	**59.8**	73	60	47	University of Geneva	
13.	Alois Schloegl	n	**52.7**	69	57	32	TU Graz	Carmen Vidaurre
14.	Ehsan Arbabi	n	**50.2**	55	52	44	Sharif University of Technology	Mohammad B. Shamsollahi
15.	Remy Lehembre	y	**50.2**	73	46	32	Universite Catholique de Louvain-la-Neuve (UCL-Belgium)	Simon Cedric
16.	Georgios Lappas	y	**45.7**	72	34	31	Technological Educational Institution (TEI) of Western Macedonia, University of Hertfordshire	Andreas Albrecht
17.	M. B. Shamsollahi	y	**45.0**	71	33	31	Sharif University of Technology	Ehsan Arbabi
18.	Ikaro Silva	y	**30.7**	39	27	26	???	
19.	Ali Salehi	n	**28.0**	27	33	25	???	
20.	Ikaro Silva2	y	**14.2**	6	11	26	???	