ICS 35.020
CCS L 67

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 47023-2026

Information technology - Brain-computer interfaces - Reference architecture

信息技术 脑机接口 参考架构

Issued on: January 28, 2026 **Implemented on: August 1, 2026**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This standard was proposed and is under the jurisdiction of the National Technical Committee on Information Technology Standardization (SAC/TC28). This document was drafted by: Zhejiang University, China Electronics Technology Standardization Institute, Nanhu Brain-Computer Interdisciplinary Research Institute, and South China Normal University. Hangzhou Dianzi University, Beijing Mechanical Equipment Research Institute, Tianjin University, Huawei Technologies Co., Ltd., University of Electronic Science and Technology of China, Chinese Academy of Medical Sciences Institute of Biomedical Engineering, ZTE Corporation, China Electronics Cloud Brain (Tianjin) Technology Co., Ltd., and South China Brain Control (Guangdong) Intelligent Technology Co., Ltd., Hangzhou Qingshi Yongjun Medical Equipment Co., Ltd., China Academy of Information and Communications Technology, China Mobile (Hangzhou) Information Technology Co., Ltd. Beijing Chipwise Neurotechnology Co., Ltd., Hangzhou Nuanxinjia Electronic Technology Co., Ltd., Boruikang Technology (Shanghai) Co., Ltd.,

Zhejiang Brainpower Technology Co., Ltd., Shanghai Jiao Tong University, Zhejiang Nurotron Neuroelectronics Technology Co., Ltd., and Harbin Engineering University. The main drafters of this document are. Pan Gang, Li Nan, Liu Xiangang, Fan Kefeng, Dong Jian, Yu Yuntao, Wang Yueming, Pan Jiahui, Kong Wanzeng, and Zhang Lijian. Ming Dong, Zhang Zheng, Yao Lin, Xu Jian, Sun Wenjing, Cui Bing, Zhang Jianhai, Chang Yuan, Xu Minpeng, Huang Heming, He Enhui, Zhao Sha, Qin Yun, Pu Jiangbo, Ma Wei Yuan Ding, Li Yuanqing, Zhou Sishu, Zhang Qian, Gao Chenguang, Zhang Lei, Zhu Jiang, Xu Honglai, Adis, Wu Ruijia, Huang Sui, Xu Li. Information Technology Brain-Computer Interface Reference Architecture

1 Scope

GB/T 47023-2026 is the Chinese national standard covering the reference architecture of a brain-computer interface - the acquisition, the signal processing and feature extraction, the decoding, the application and the feedback to the user, and the safety and data protection that run through all of it. First edition, and the frame that GB/T 47127-2026 on the data format fits into. It was issued on 28 January 2026 and has been in force since 1 August 2026, as a first edition. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document establishes a reference architecture for brain-computer interfaces and describes the user view and functional view of brain-computer interfaces. This document applies to the construction, implementation, and maintenance of brain-computer interface systems.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Brain-computer interface (BCI) A system that establishes a direct communication connection between the central nervous system of humans or other animals and external hardware and software systems.

Note. Brain-computer interfaces enable one-way or two-way communication between the brain and external devices, and can be used for control and/or feedback.

3.2 architecture The basic concepts or attributes of an entity in its environment, and the

realization and evolution of that entity and its related life cycle processes. Governance principles. [Source: ISO /IEC /IEEE 42010.2022, 3.2]

4 General Principles

This document presents two reference architectures for brain-computer interfaces from the user's perspective and the functional perspective. The user-perspective reference architecture (hereinafter referred to as the user view) is used to describe the activities of the various parties involved in the brain-computer interface. The functional reference architecture (hereinafter referred to as the functional view) is used to describe the functions required to realize brain-computer interface activities.

5 User View

5.1 Overview The user view mainly includes the following aspects.

a) Brain-computer interface participants. one or a group of natural or legal persons who are the executors of brain-computer interface activities;

b) Brain-computer interface activities. a set of specific tasks performed by the participants; brain-computer interface activities require a goal, achieved through function... It can be implemented as a component and can deliver one or more results. The user view of the brain-computer interface reference architecture is shown in Figure 1.