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Information technology - Brain-computer interfaces - Reference architecture

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FOREWORD

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The text of this International Standard is based on the following documents:

Draft	Report on voting
JTC1-SC43/211/FDIS	JTC1-SC43/225/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1, and the ISO/IEC Directives, JTC 1 Supplement available at www.iec.ch/members_experts/refdocs and www.iso.org/directives.

INTRODUCTION

Brain–computer interface (BCI) is a revolutionary technology that aims to establish a direct communication pathway between the brain and an external device, such as a computer or a prosthetic limb. It holds immense potential for enhancing capabilities, enabling individuals with disabilities to regain lost functions, and providing new avenues for human–computer interaction.

The development of a BCI system involves the integration of various components. These components work in synergy to decode the electrical or neurochemical signals generated by the brain, translating them into meaningful commands or actions that can be used to control external devices.

This document presents a comprehensive reference architecture (RA) for BCI. The BCI RA identifies and highlights architectural concerns commonly found in BCI systems across industrial sectors and classifies them into viewpoints along with their respective stakeholders. It describes, analyses and, where appropriate, provides guidance to resolve these concerns in these viewpoints, resulting in a certain abstract architecture representation.

1 Scope

This document specifies the brain–computer interface (BCI) reference architecture (RA). The BCI RA defines the key characteristics of BCI systems, provides a common language for stakeholders, and addresses their concerns. It also provides guidance to system architects on efficient BCI system design, typical implementation categories and effects of using BCI technology in developing applications. Additionally, this document serves as a technical reference for architects, manufacturers, vendors, service providers, regulators and the public to better understand the BCI architecture, its functions and the underlying technology that supports the BCI systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 8663, *Information technology - Brain–computer interfaces - Vocabulary*

Bibliography

- [1] ISO/IEC/IEEE 42010, *Systems and software engineering - Architecture description*
 - [2] ISO/IEC 27001, *Information security, cybersecurity and privacy protection - Information security management systems - Requirements*
 - [3] ISO/IEC 27559, *Information security, cybersecurity and privacy protection - Privacy enhancing data de-identification framework*
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