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Safety of machinery — Relationship with ISO 12100 —

Part 5: Implications of artificial intelligence machine learning

Sécurité des machines — En relation avec l'ISO 12100 —

Partie 5: Implications de l'intelligence artificielle pour l'apprentissage automatique

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Foreword

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This document was prepared by Technical Committee ISO/TC 199, *Safety of machinery*.

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The primary purpose of this document is to provide guidance for the development of artificial intelligence (AI) machine learning applications. Safety can be compromised due to the significant complexity of introducing AI machine learning to machines.

A control system can use machine learning (a technology of artificial intelligence) to improve performance of the machine or to execute tasks. The control system learns its expected behaviour through training. This involves two stages: training and inference (autonomous operation).

This document assists machinery designers to develop solutions appropriate for their particular applications. It describes how to apply the risk assessment process according to ISO 12100 to AI machine learning applications.

AI machine learning is a rapidly evolving technology and has not been a subject of machinery safety until now.

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Safety of machinery — Relationship with ISO 12100 —

Part 5: Implications of artificial intelligence machine learning

1 Scope

This document addresses how artificial intelligence machine learning can impact the safety of machinery and machinery systems.

This document describes how hazards being associated with artificial intelligence (AI) applications machine learning in machinery or machinery systems, and designed to act within specific limits, can be considered in the risk assessment process.

This document is not applicable to machinery or machinery systems with AI applications machine learning designed to act beyond specified limits that can result in unpredictable effects.

This document does not address safety systems with AI, for example, safety-related sensors and other safety-related parts of control systems.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
artificial intelligence
AI
branch of science devoted to developing data processing systems that perform functions normally associated with human intelligence, such as reasoning, learning, and self-improvement

[SOURCE: ISO/IEC 2382:2015, 2121393, modified – The word "computer" has been deleted from the definition.]

3.2
machine learning
process using algorithms rather than procedural coding that enables learning from existing data in order to predict future outcomes

[SOURCE: ISO/IEC 38505-1:2017, 3.7]

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