

Framework for Artificial Intelligence (AI) Systems
Using Machine Learning (ML) (ISO/IEC 23053:2022)

EESTI STANDARDI EESSÕNA

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English version

Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML) (ISO/IEC 23053:2022)

Cadre méthodologique pour les systèmes d'intelligence
artificielle (IA) utilisant l'apprentissage machine
(ISO/IEC 23053:2022)

Framework für Systeme der Künstlichen Intelligenz
(KI) basierend auf maschinellem Lernen (ML) (ISO/IEC
23053:2022)

This European Standard was approved by CEN on 26 June 2023.

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Rue de la Science 23, B-1040 Brussels**

European foreword

The text of ISO/IEC 23053:2022 has been prepared by Technical Committee ISO/IEC JTC 1 "Information technology" of the International Organization for Standardization (ISO) and has been taken over as EN ISO/IEC 23053:2023 by Technical Committee CEN-CENELEC/ JTC 21 "Artificial Intelligence" the secretariat of which is held by DS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2023, and conflicting national standards shall be withdrawn at the latest by December 2023.

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Endorsement notice

The text of ISO/IEC 23053:2022 has been approved by CEN-CENELEC as EN ISO/IEC 23053:2023 without any modification.

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 Model development and use	1
3.2 Tools	2
3.3 Data	2
4 Abbreviated terms	3
5 Overview	4
6 Machine learning system	4
6.1 Overview	4
6.2 Task	5
6.2.1 General	5
6.2.2 Regression	6
6.2.3 Classification	6
6.2.4 Clustering	6
6.2.5 Anomaly detection	6
6.2.6 Dimensionality reduction	7
6.2.7 Other tasks	7
6.3 Model	7
6.4 Data	8
6.5 Tools	9
6.5.1 General	9
6.5.2 Data preparation	9
6.5.3 Categories of ML algorithms	10
6.5.4 ML optimisation methods	14
6.5.5 ML evaluation metrics	16
7 Machine learning approaches	19
7.1 General	19
7.2 Supervised machine learning	20
7.3 Unsupervised machine learning	22
7.4 Semi-supervised machine learning	23
7.5 Self-supervised machine learning	23
7.6 Reinforcement machine learning	23
7.7 Transfer learning	24
8 Machine learning pipeline	25
8.1 General	25
8.2 Data acquisition	26
8.3 Data preparation	27
8.4 Modelling	28
8.5 Verification and validation	30
8.6 Model deployment	30
8.7 Operation	30
8.8 Example machine learning process based on ML pipeline	31
Annex A (informative) Example data flow and data use statements for supervised learning process	34
Bibliography	36

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 42, *Artificial Intelligence*.

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Introduction

Artificial intelligence (AI) systems, in general, are engineered systems that generate outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives. AI covers a wide range of technologies that reflect different approaches to dealing with these complex problems.

ML is a branch of AI that employs computational techniques to enable systems to learn from data or experiences. In other words, ML systems are developed through the optimisation of algorithms to fit to training data, or improve their performance based through maximizing a reward. ML methods include deep learning, which is also addressed in this document.

Terms such as knowledge, learning and decisions are used throughout the document. However, it is not the intent to anthropomorphize machine learning (ML).

This document aims to provide a framework for the description of AI systems that use ML. By establishing a common terminology and a common set of concepts for such systems, this document provides a basis for the clear explanation of the systems and various considerations that apply to their engineering and to their use. This document is intended for a wide audience including experts and non-practitioners. However, some of the clauses (identified in the overview in [Clause 5](#)), include more in-depth technical descriptions.

This document also provides the basis for other standards directed at specific aspects of ML systems and their components.

Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML)

1 Scope

This document establishes an Artificial Intelligence (AI) and Machine Learning (ML) framework for describing a generic AI system using ML technology. The framework describes the system components and their functions in the AI ecosystem. This document is applicable to all types and sizes of organizations, including public and private companies, government entities, and not-for-profit organizations, that are implementing or using AI 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 22989, *Information technology—Artificial intelligence — Artificial intelligence concepts and terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 22989 and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Model development and use

3.1.1

classification model

<machine learning> machine learning model whose expected output for a given input is one or more classes

3.1.2

regression model

<machine learning> machine learning model whose expected output for a given input is a continuous variable

3.1.3

generalization

<machine learning> ability of a trained model to make correct predictions on previously unseen input data

Note 1 to entry: A machine learning model that generalizes well is one that has acceptable prediction accuracies using previously unseen input data.

Note 2 to entry: Generalization is closely related to overfitting. An overfit machine learning model will not generalize well as the model fits the training data too precisely.