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Information technology - Artificial intelligence - Artificial intelligence concepts and terminology (ISO/IEC 22989:2022)

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EN ISO/IEC 22989

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Information technology - Artificial intelligence - Artificial intelligence concepts and terminology (ISO/IEC 22989:2022)

Technologies de l'information - Intelligence artificielle - Concepts et terminologie relatifs à l'intelligence artificielle (ISO/IEC 22989:2022)

Informationstechnik - Künstliche Intelligenz - Konzepte und Terminologie der Künstlichen Intelligenz (ISO/IEC 22989:2022)

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INTERNATIONAL STANDARD

ISO/IEC 22989

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Information technology — Artificial intelligence — Artificial intelligence concepts and terminology

Technologies de l'information — Intelligence artificielle — Concepts et terminologie relatifs à l'intelligence artificielle

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Contents

Page

Foreword ... **vi**
Introduction ... **vii**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
3.1 Terms related to AI ... 1
3.2 Terms related to data ... 6
3.3 Terms related to machine learning ... 8
3.4 Terms related to neural networks ... 10
3.5 Terms related to trustworthiness ... 11
3.6 Terms related to natural language processing ... 13
3.7 Terms related to computer vision ... 16
4 Abbreviated terms ... **16**
5 AI concepts ... **17**
5.1 General ... 17
5.2 From strong and weak AI to general and narrow AI ... 17
5.3 Agent ... 17
5.4 Knowledge ... 18
5.5 Cognition and cognitive computing ... 19
5.6 Semantic computing ... 19
5.7 Soft computing ... 19
5.8 Genetic algorithms ... 19
5.9 Symbolic and subsymbolic approaches for AI ... 19
5.10 Data ... 20
5.11 Machine learning concepts ... 21
5.11.1 Supervised machine learning ... 21
5.11.2 Unsupervised machine learning ... 21
5.11.3 Semi-supervised machine learning ... 22
5.11.4 Reinforcement learning ... 22
5.11.5 Transfer learning ... 22
5.11.6 Training data ... 22
5.11.7 Trained model ... 22
5.11.8 Validation and test data ... 22
5.11.9 Retraining ... 23
5.12 Examples of machine learning algorithms ... 24
5.12.1 Neural networks ... 24
5.12.2 Bayesian networks ... 25
5.12.3 Decision trees ... 25
5.12.4 Support vector machine ... 25
5.13 Autonomy, heteronomy and automation ... 26
5.14 Internet of things and cyber-physical systems ... 27
5.14.1 General ... 27
5.14.2 Internet of things ... 27
5.14.3 Cyber-physical systems ... 27
5.15 Trustworthiness ... 28
5.15.1 General ... 28
5.15.2 AI robustness ... 28
5.15.3 AI reliability ... 29
5.15.4 AI resilience ... 29
5.15.5 AI controllability ... 29
5.15.6 AI explainability ... 29
5.15.7 AI predictability ... 30

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5.15.8 AI transparency 30
5.15.9 AI bias and fairness 30
5.16 AI verification and validation 31
5.17 Jurisdictional issues 31
5.18 Societal impact 32
5.19 AI stakeholder roles 32
5.19.1 General 32
5.19.2 AI provider 33
5.19.3 AI producer 33
5.19.4 AI customer 34
5.19.5 AI partner 34
5.19.6 AI subject 34
5.19.7 Relevant authorities 35

6 AI system life cycle 35
6.1 AI system life cycle model 35
6.2 AI system life cycle stages and processes 37
6.2.1 General 37
6.2.2 Inception 37
6.2.3 Design and development 38
6.2.4 Verification and Validation 39
6.2.5 Deployment 39
6.2.6 Operation and monitoring 39
6.2.7 Continuous validation 40
6.2.8 Re-evaluation 40
6.2.9 Retirement 40

7 AI system functional overview 40
7.1 General 40
7.2 Data and information 41
7.3 Knowledge and learning 41
7.4 From predictions to actions 42
7.4.1 General 42
7.4.2 Prediction 42
7.4.3 Decision 43
7.4.4 Action 43

8 AI ecosystem 43
8.1 General 43
8.2 AI systems 45
8.3 AI function 45
8.4 Machine learning 45
8.4.1 General 45
8.5 Engineering 46
8.5.1 General 46
8.5.2 Expert systems 46
8.5.3 Logic programming 46
8.6 Big data and data sources — cloud and edge computing 46
8.6.1 Big data and data sources 46
8.6.2 Cloud and edge computing 48
8.7 Resource pools 50
8.7.1 General 50
8.7.2 Application-specific integrated circuit 50

9 Fields of AI 51
9.1 Computer vision and image recognition 51
9.2 Natural language processing 51
9.2.1 General 51
9.2.2 Natural language processing components 52
9.3 Data mining 54

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9.4 Planning 54
10 Applications of AI systems 54
10.1 General 54
10.2 Fraud detection 55
10.3 Automated vehicles 55
10.4 Predictive maintenance 56
Annex A (informative) **Mapping of the AI system life cycle with the OECD's definition of an AI system life cycle 57**
Bibliography 59

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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

Advancements in computing capacity, reduction of costs of computation, availability of large amounts of data from many sources, inexpensive online learning curricula and algorithms capable of meeting or exceeding human level performance in particular tasks for speed and accuracy have enabled practical applications of AI, making it an increasingly important branch of information technology.

AI is a highly interdisciplinary field broadly based on computer science, data science, natural sciences, humanities, mathematics, social sciences and others. Terms such as “intelligent”, “intelligence”, “understanding”, “knowledge”, “learning”, “decisions”, “skills”, etc. are used throughout this document. However, it is not the intention to anthropomorphize AI systems, but to describe the fact that some AI systems can rudimentarily simulate such characteristics.

There are many areas of AI technology. These areas are intricately linked and developing rapidly so it is difficult to fit the relevance of all technical fields into a single map. Research of AI includes aspects such as aspects including “learning, recognition and prediction”, “inference, knowledge and language” and “discovery, search and creation”. Research also addresses interdependencies among these aspects[23].

The concept of AI as an input and output process flow is shared by many AI researchers, and research on each step of this process is ongoing. Standardized concepts and terminology are needed by stakeholders of the technology to be better understood and adopted by a broader audience. Furthermore, concepts and categories of AI allow for a comparison and classification of different solutions with respect to properties like trustworthiness, robustness, resilience, reliability, accuracy, safety, security and privacy. This enables stakeholders to select appropriate solutions for their applications and to compare the quality of available solutions on the market.

As this document does provide a definition for the term AI in the sense of a discipline only, the context for its usage can be described as follows: AI is a technical and scientific field devoted to the engineered system that generates outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives.

This document provides standardized concepts and terminology to help AI technology to be better understood and used by a broader set of stakeholders. It is intended for a wide audience including experts and non-practitioners. The reading of some specific clauses can however be easier with a stronger background in computer science. These concerns are described primarily Clauses 5.10, 5.11 and 8, which are more technical than the rest of the document.

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Information technology — Artificial intelligence — Artificial intelligence concepts and terminology

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1 Scope

This document establishes terminology for AI and describes concepts in the field of AI.

This document can be used in the development of other standards and in support of communications among diverse, interested parties or stakeholders.

This document is applicable to all types of organizations (e.g. commercial enterprises, government agencies, not-for-profit organizations).

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 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 Terms related to AI

3.1.1
AI agent
automated (3.1.7) entity that senses and responds to its environment and takes actions to achieve its goals

3.1.2
AI component
functional element that constructs an *AI system* (3.1.4)

3.1.3
artificial intelligence
AI
<discipline> research and development of mechanisms and applications of *AI systems* (3.1.4)

Note 1 to entry: Research and development can take place across any number of fields such as computer science, data science, humanities, mathematics and natural sciences.

3.1.4
artificial intelligence system
AI system
engineered system that generates outputs such as content, forecasts, recommendations or decisions for a given set of human-defined objectives

Note 1 to entry: The engineered system can use various techniques and approaches related to *artificial intelligence* (3.1.3) to develop a *model* (3.1.23) to represent data, *knowledge* (3.1.21), processes, etc. which can be used to conduct *tasks* (3.1.35).

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