

# DRAFT INTERNATIONAL STANDARD

## ISO/IEC DIS 23053

ISO/IEC JTC 1/SC 42

Secretariat: ANSI

Voting begins on:  
2021-06-11

Voting terminates on:  
2021-09-03

---

---

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

ICS: 35.020

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

**IMPORTANT** — Please use this updated version dated 2021-06-07, and discard any previous version of this DIS because of addition of line numbering.

This document is circulated as received from the committee secretariat.



Reference number  
ISO/IEC DIS 23053:2021(E)

© ISO/IEC 2021



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

## 14 Contents

15

16	Foreword .....	v
17	Introduction.....	vi
18	1 Scope .....	1
19	2 Normative references .....	1
20	3 Terms and definitions.....	1
21	3.1 General .....	1
22	3.2 Model development and use .....	1
23	3.3 Tools .....	2
24	3.4 Data.....	2
25	4 Abbreviated terms .....	3
26	5 Overview.....	4
27	6 Machine learning system .....	4
28	6.1 Overview.....	4
29	6.2 Model development and use .....	5
30	6.2.1 Application.....	5
31	6.2.2 Model .....	5
32	6.2.3 Task .....	6
33	6.3 Tools .....	8
34	6.3.1 General .....	8
35	6.3.2 Data pre-processing .....	9
36	6.3.3 Categories of ML algorithms .....	9
37	6.3.4 ML optimization methods .....	14
38	6.3.5 ML evaluation metrics .....	15
39	6.4 Data for machine learning.....	18
40	7 Machine learning approaches.....	18
41	7.1 General .....	18
42	7.2 Supervised machine learning.....	19
43	7.3 Unsupervised machine learning .....	20
44	7.4 Semi-supervised machine learning.....	21
45	7.5 Reinforcement machine learning.....	21
46	7.6 Transfer learning.....	22
47	8 Machine learning pipeline.....	22
48	8.1 General .....	22
49	8.2 Data acquisition .....	23
50	8.3 Data pre-processing.....	23
51	8.4 Modelling.....	24
52	8.5 Model deployment.....	26
53	8.6 Operation.....	26
54	8.7 Example machine learning process based on ML pipeline.....	26
55	9 Machine learning process.....	28
56	9.1 General .....	28
57	9.2 Model creation stage .....	28
58	9.2.1 General .....	28
59	9.2.2 Data.....	28
60	9.2.3 Model development and use.....	29
61	9.2.4 Tools.....	30