

Title: MindSpore

URL: <https://en.wikipedia.org/wiki/MindSpore>

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Categories: Category:2020 software, Category:Deep learning software, Category:Free software programmed in C++, Category:Free statistical software, Category:Huawei products, Category:Open-source artificial intelligence, Category:Software using the Apache license

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Supervised learning

Unsupervised learning

Semi-supervised learning

Self-supervised learning

Reinforcement learning

Meta-learning

Online learning

Batch learning

Curriculum learning

Rule-based learning

Neuro-symbolic AI

Neuromorphic engineering

Quantum machine learning

Classification

Generative modeling

Regression

Clustering

Dimensionality reduction

Density estimation

Anomaly detection

Data cleaning

AutoML

Association rules

Semantic analysis

Structured prediction

Feature engineering

Feature learning

Learning to rank

Grammar induction

Ontology learning

Multimodal learning

Apprenticeship learning

Decision trees

Ensembles Bagging Boosting Random forest

Bagging

Boosting

Random forest

k -NN

Linear regression

Naive Bayes

Artificial neural networks

Logistic regression

Perceptron

Relevance vector machine (RVM)

Support vector machine (SVM)

BIRCH

CURE

Hierarchical

k -means

Fuzzy

Expectation–maximization (EM)

DBSCAN

OPTICS

Mean shift

Factor analysis

CCA

ICA

LDA

NMF

PCA

PGD

t-SNE

SDL

Graphical models Bayes net Conditional random field Hidden Markov

Bayes net

Conditional random field

Hidden Markov

RANSAC

k -NN

Local outlier factor

Isolation forest

Autoencoder

Deep learning

Feedforward neural network

Recurrent neural network LSTM GRU ESN reservoir computing

LSTM

GRU

ESN

reservoir computing

Boltzmann machine Restricted

Restricted

GAN

Diffusion model

SOM

Convolutional neural network U-Net LeNet AlexNet DeepDream

U-Net

LeNet

AlexNet

DeepDream

Neural field Neural radiance field Physics-informed neural networks

Neural radiance field

Physics-informed neural networks

Transformer Vision

Vision

Mamba

Spiking neural network

Memtransistor

Electrochemical RAM (ECRAM)

Q-learning

Policy gradient

SARSA

Temporal difference (TD)

Multi-agent Self-play

Self-play

Active learning

Crowdsourcing

Human-in-the-loop

Mechanistic interpretability

RLHF

Coefficient of determination

Confusion matrix

Learning curve

ROC curve

Kernel machines

Bias–variance tradeoff

Computational learning theory

Empirical risk minimization

Occam learning

PAC learning

Statistical learning

VC theory

Topological deep learning

AAAI

ECML PKDD

NeurIPS

ICML

ICLR

IJCAI

ML

JMLR

Glossary of artificial intelligence

List of datasets for machine-learning research List of datasets in computer vision and image processing

List of datasets in computer vision and image processing

Outline of machine learning

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MindSpore is a open-source software framework for deep learning , machine learning and artificial intelligence developed by Huawei . [ 1 ] [ 2 ]

Overview

MindSpore provides support for Python by allowing users to define models, control flow, and custom operators using native Python syntax. Unlike graph-based frameworks that require users to learn DSL or complex APIs, MindSpore adopts a source-to-source (S2S) automatic differentiation approach, allowing Python code to be automatically transformed into optimized computational graphs. [ 3 ]

It has support for custom OpenHarmony -based HarmonyOS NEXT single core framework system built for HarmonyOS , includes an AI system stack that comes with Huawei 's built LLM model called PanGu- $\Sigma$  with full MindSpore framework support. [ 4 ] Alongside, OpenHarmony Native device-side AI support for training interface and ArkTS programming interface for its NNrt (Neural Network Runtime) backend configurations via MindSpore Lite AI framework codebase introduced in API 11 Beta 1 of OpenHarmony 4.1. MindSpore platform runs on Ascend AI chips and Kirin alongside other HiSilicon NPU chips. [ 5 ]

CANN (Compute Architecture of Neural Networks), heterogeneous computing architecture for AI developed by Huawei. With CANN backend in OpenCV DNN, giving developers ability to run created AI models on the Ascend, Kirin and other HiSilicon NPU enabled chips. [ 6 ]

It supports cross platform development such as Android , iOS , Windows , [ 7 ] global OpenHarmony-based distro, Eclipse Oniro, Linux-based EulerOS alongside OpenEuler Huawei's server OS platforms, macOS and Linux . [ 8 ] [ 9 ]

## History

On April 24, 2024, Huawei's MindSpore 2.3.RC1 was released to open source community with Foundation Model Training, Full-Stack Upgrade of Foundation Model Inference, Static Graph Optimization, IT Features and new MindSpore Elec MT (MindSpore-powered magnetotelluric) Intelligent Inversion Model. [ 10 ]

See also

Free and open-source software portal

Comparison of deep learning software

Differentiable programming

TensorFlow

Keras

CUDA

References

Bibliography

Huawei MindSpore AI Development Framework (1st (Online) ed.). Springer, Singapore . October 22, 2022. pp. 137– 162. ISBN 978-981-19-2879-6 .

Deep Learning and Mindspore Practice (Huawei Intelligent Computing Technology Series)(Chinese Edition) (1st ed.). Tsinghua University Press . March 1, 2020. p. 355. ISBN 978-7302546610 .

External links

Official website

Learning MindSpore Web

Deep Learning and Practice with MindSpore Book (ENG)

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Huawei Ascend

Ascend P P1 P2 P6 P7

P1

P2

P6

P7

Ascend D D quad quad XL D1 1 XL D2

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D1 1 XL

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Ascend G G6 G7 G300 G312 G330 G600 G750

G6

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Ascend Mate Mate 2 Mate 7

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W2

Ascend Y300

Huawei P8 P8 Max

P8 Max

P9 9 Plus 9 lite

9 Plus

9 lite

P10

P20

P30

P40 40 lite

40 lite

P50 50 Pocket

50 Pocket

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Pura 70 70 Pro 70 Pro+ 70 Ultra

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Huawei Mate S

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XT Ultimate Design

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M835  
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T158  
T161L  
T201  
T208  
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T261L  
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U1310  
U2801  
U3300  
U7310  
U7510  
T-Mobile Tap (U7519)  
U8100  
U8110  
IDEOS U8150  
T-Mobile Pulse (U8220)  
U8230  
U8800  
U9130 Compass  
U9150  
Nexus 6P  
Huawei Ideos Tablet S7  
Honor Tablet 5  
Mediapad M5  
Mediapad M6  
MatePad Pro  
MateBook  
MateBook X Pro  
Watch GT  
X Gentle Monster Eyewear  
Watch GT 2 2e 2 Pro

2e  
2 Pro  
Watch Fit  
X Gentle Monster Eyewear II  
Kirin  
Kunpeng , Ascend  
Atlas  
Tiangang (5G)  
Balong (modem: 5G/5.5G)  
EulerOS  
openEuler  
UniProton  
NestOS  
HarmonyOS NEXT kernel ; OpenHarmony version history  
NEXT  
kernel ;  
OpenHarmony  
version history  
LiteOS  
EMUI  
Huawei VRP  
E5  
E220  
SingleRAN  
4G eLTE  
Ark Compiler  
BiSheng Compiler  
DevEco Studio  
ArkTS  
eTS  
Cangjie  
Hvigor  
EROFS  
Huawei PanGu  
MindSpore  
ArkUI  
ArkUI-X  
GaussDB

openGauss  
ArkData  
MetaERP  
Celia  
Huawei HiCar  
NearLink  
Softswitches  
Next generation home location register  
Internet Protocol Multimedia Subsystems  
xDSL  
Passive optical network  
Network switches  
Service delivery platforms  
Base station subsystems  
Mobile Services AppGallery HMS Core Petal Maps  
AppGallery  
HMS Core  
Petal Maps  
Network integration  
Object storage  
Music  
Video  
Cloud  
GameCenter  
Themes  
Health  
Find Device  
Ren Zhengfei (CEO)  
Liang Hua (Chairman)  
Sun Yafang (former chairwoman)  
Meng Wanzhou (deputy chair & CFO)  
Xu Zhijun (deputy chair)  
New IP  
Developer Conference  
Developer Day  
Symantec  
HiSilicon  
Criticism Li Hongyuan incident

Li Hongyuan incident  
Huawei the Beautiful  
Nano Memory  
FreeBuds  
Sound X  
Sound Joy  
Vision  
MateView  
MateBook  
MateStation  
HarmonyOS Sans  
Huawei MRP  
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Ox Horn Campus  
Intelligent Automotive Solution  
Intelligent Mobility Alliance  
SiCarrier  
Huawei LianqiuHu  
Commons  
Category  
v  
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Comparison  
Apache MXNet  
Apache SINGA  
Caffe  
Deeplearning4j  
DeepSpeed  
Dlib  
Keras  
Microsoft Cognitive Toolkit  
ML.NET  
OpenNN  
PyTorch  
TensorFlow  
Theano  
Torch

ONNX

OpenVINO

MindSpore

Apple Core ML

IBM Watson

Neural Designer

Wolfram Mathematica

MATLAB Deep Learning Toolbox

Category

v

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Differentiable programming

Information geometry

Statistical manifold

Automatic differentiation

Neuromorphic computing

Pattern recognition

Ricci calculus

Computational learning theory

Inductive bias

IPU

TPU

VPU

Memristor

SpiNNaker

TensorFlow

PyTorch

Keras

scikit-learn

Theano

JAX

Flux.jl

MindSpore

Portals Computer programming Technology

Computer programming

Technology