

УСКОРЕНИЕ АЛГОРИТМОВ КОМПЬЮТЕРНОГО ЗРЕНИЯ С INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT

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INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT



What it is

A toolkit to accelerate development of **high performance computer vision** and **deep learning into vision applications** from device to cloud. It enables deep learning on hardware accelerators and easy **heterogeneous** execution across multiple types of Intel® platforms. The toolkit includes:

- Intel® Deep Learning Deployment Toolkit
- Optimized functions for OpenCV*, media encode/decode, and more
- 20+ pre-trained models, code samples, supports 100+ public and custom models

Why important

Demand is growing for intelligent vision solutions.

- **Deep learning revenue** is estimated to grow from \$655M in 2016 to **\$35B by 2025**¹.

This requires **developer tools** to integrate computer vision, deep learning, and analytics processing capabilities into applications, so they can help **turn data into insights that fuel artificial intelligence**.

Users & Usages: Software developers, data scientists working on vision solutions for surveillance, robotics, healthcare, AI, office automation, transportation, & more. Some non-vision use cases such as speech also apply.







Free Download ▶
software.intel.com/opencvino-toolkit

Open source version ▶
01.org/opencvinotoolkit

BENEFITS OF INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT

Maximize the Power of Intel® Processors
CPU, GPU/Intel® Processor Graphics, FPGA,VPU

 ACCELERATE PERFORMANCE	 INTEGRATE DEEP LEARNING
Access Intel computer vision accelerators. Speed code performance. Supports heterogeneous execution.	Unleash CNN-based deep learning inference using a common API, 20+ pre-trained models, & computer vision algorithms. Validated on more than 100 public/custom models.
 SPEED DEVELOPMENT	 INNOVATE & CUSTOMIZE
Reduce time using a library of optimized OpenCV* & OpenVX* functions, & 15+ samples. Develop once, deploy for current & future Intel-based devices.	Use OpenCL™ kernels/tools to add your own unique code. Customize layers without the overhead of frameworks.

WHAT'S INSIDE INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT

Intel® Deep Learning Deployment Toolkit

Model Optimizer

Convert & Optimize



Inference Engine

Optimized Inference

20+ Pre-trained Models

Computer Vision Algorithms

Samples

IR = Intermediate Representation file



Traditional Computer Vision

Optimized Libraries & Code Samples

OpenCV*

OpenVX*

Code Samples

For Intel® CPU & GPU/Intel® Processor Graphics

Tools & Libraries

Increase Media/Video/Graphics Performance

Intel® Media SDK

Open Source version

OpenCL™

Drivers & Runtimes

For GPU/Intel® Processor Graphics

Optimize Intel® FPGA (Linux* only)

FPGA RunTime Environment

(from Intel® FPGA SDK for OpenCL™)

Bitstreams

OS Support CentOS* 7.4 (64 bit) Ubuntu* 16.04.3 LTS (64 bit) Microsoft Windows* 10 (64 bit) Yocto Project* version Poky Jethro v2.0.3 (64 bit)

Intel® Architecture-Based Platforms Support



Intel® Vision Accelerator Design Products & Intel/Partner Developer Kits

An open source version is available at 01.org/openvintoolkit (some deep learning functions support Intel CPU/GPU only).

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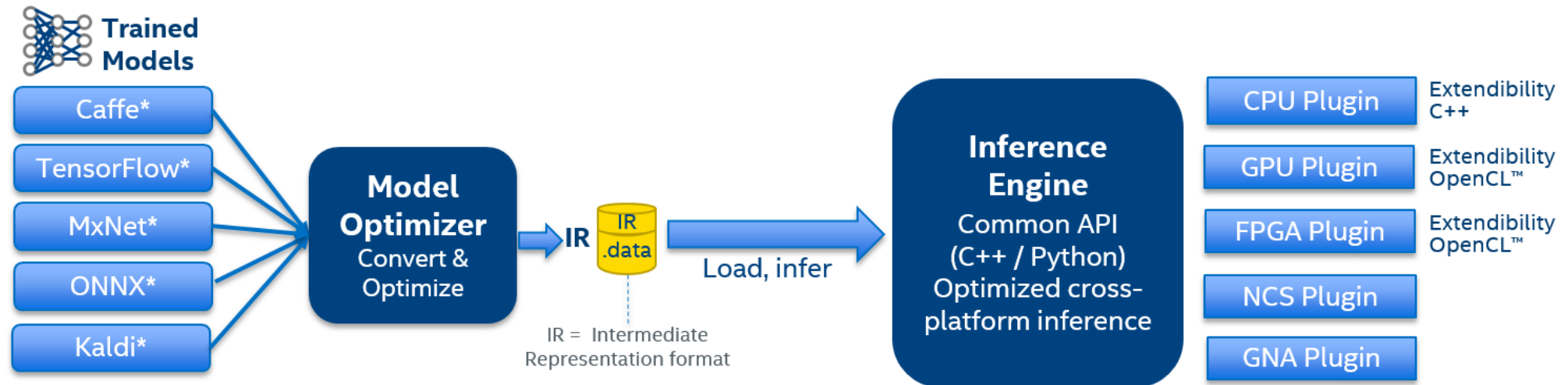
INTEL[®] DEEP LEARNING DEPLOYMENT TOOLKIT

Model Optimizer

- **What it is:** A python based tool to import trained models and convert them to Intermediate representation.
- **Why important:** Optimizes for performance/space with conservative topology transformations; biggest boost is from conversion to data types matching hardware.

Inference Engine

- **What it is:** High-level inference API
- **Why important:** Interface is implemented as dynamically loaded plugins for each hardware type. Delivers best performance for each type without requiring users to implement and maintain multiple code pathways.



GPU = Intel CPU with integrated graphics processing unit/Intel[®] Processor Graphics

OPENVINO™ TOOLKIT IS OPEN SOURCED!

- Provides flexibility and availability to the developer community to extend OpenVINO™ toolkit for custom needs
- Components that are open sourced
 - Deep Learning Deployment Toolkit with CPU, GPU & Heterogeneous plugins
github.com/opencv/dldt
 - Open Model Zoo - includes pre-trained models, model downloader, demos and samples - github.com/opencv/open_model_zoo
- See [FAQ](#) for key differences between OpenVINO™ Toolkit (open source) and Intel® Distribution of OpenVINO™ Toolkit (Intel version)



More details ► 01.org/openvinotoolkit

OpenVINO™

INTEL® VISION PRODUCTS **IN REAL APPLICATIONS**



BONE AGE PREDICTION & LUNG CT SCAN

188x Increase in images/sec for Bone Age Prediction
30X increase in Images/sec for Lung Segmentation Model



RAPID MEDICAL DIAGNOSES

4x performance increase using OpenVINO toolkit for classifier of aged macular degeneration images



SMART CITIES

10x performance increase with OpenVINO™ toolkit
5x less hardware needed producing ROI
City Trash Detected & Collected faster



SURVEILLANCE

9000+ surveillance cameras used to protect 2 Million+ fans
with 9.1x performance increase using OpenVINO™ toolkit

OTHER SUCCESS STORIES/CASE STUDIES

New!



NexCOBOT Delivers Robotics with AI for Industry 4.0L

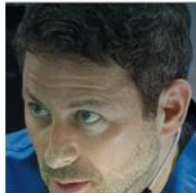
NexCOBOT, a NEXCOM company, offers a flexible, modular robotics solution integrating artificial intelligence (AI) with machine vision, powered by Intel® Vision Accelerator Design products and optimized by Intel® Distribution of OpenVINO™ toolkit.



Philips Performs AI-Driven Medical Imaging Efficiently and Cost-Effectively on Intel® CPU-Based Systems

Philips demonstrates breakthrough performance for AI inferencing of healthcare workloads run on servers powered by Intel® Xeon® Scalable processors and optimized with the OpenVINO™ toolkit.

New!



QNAP/IEI Develop AI Solutions for Healthcare

Together, Intel and QNAP/IEI have come up with a solution that offers developers, data scientists, medical researchers, and students a quick-to-deploy computer vision system combining a workstation, deep learning software development kit (Intel® Distribution of OpenVINO™ toolkit), and powerful NAS.

New!



For Somatic, Deep Learning Brings Touch to Robots

Deep learning algorithms that enable touch as well as vision can create tremendous opportunities for robotics applications. Intel® Software Development Tools can help devs take advantage of enabling technologies that bring touch to the forefront and are fueled by the latest artificial intelligence (AI) advances.

New!



ADLINK and Touch Cloud Deliver AI Solutions Powered by Intel® Vision Products

DLINK, Touch Cloud, and Intel provide a turnkey AI engine to assist in data analytics, detection, classification, and prediction for a wide range of use cases, optimized by Intel Distribution of OpenVINO toolkit.

New!



Advantech Addresses Major Retail Dilemmas with Intel® Vision Products

Advantech deploys a combination of hardware and software including cameras, AI deep learning, and video analysis technology optimized by Intel® Distribution of OpenVINO™ toolkit and Intel® Vision Accelerator Design products.

New!



Agent VI* Delivers the Next Generation of Digital Security and Surveillance Solutions

Intel® Distribution of OpenVINO™ toolkit is the centerpiece of computer Agent VI's next-gen vision solutions.

GeoVision Gets a 24x Deep Learning Algorithm Performance Boost

GeoVision turbo-charges its deep learning facial recognition solution using Intel® System Studio and the OpenVINO™ toolkit.

GE Healthcare and Intel Optimize Deep Learning Performance for Healthcare Imaging

Intel® Math Kernel Library and OpenVINO™ toolkit help bring the power of AI to clinical diagnostic scanning and other healthcare workflows.

DEMO - INTERACTIVE FACE DETECTION

- Face Detection
- Age/Gender Recognition
- Head Pose Estimation
- Emotions Recognition
- Facial Landmarks Detection



Live demo

```
>C:\Intel\computer_vision_sdk_2018.4.420\bin\setupvars.bat  
>interactive_face_detection_demo.exe -m  
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```

CALL TO ACTION, RESOURCES

- Download ▶
Free Intel® Distribution of OpenVINO™ toolkit
- Get started quickly with:
 - [Developer resources](#)
 - [Intel® Tech.Decoded online webinars, tool how-tos & quick tips](#)
 - [Hands-on developer workshops](#)
- Support
 - Connect with Intel engineers & computer vision experts at the public [Community Forum](#)

Select Intel customers may contact their Intel representative for issues beyond forum support.

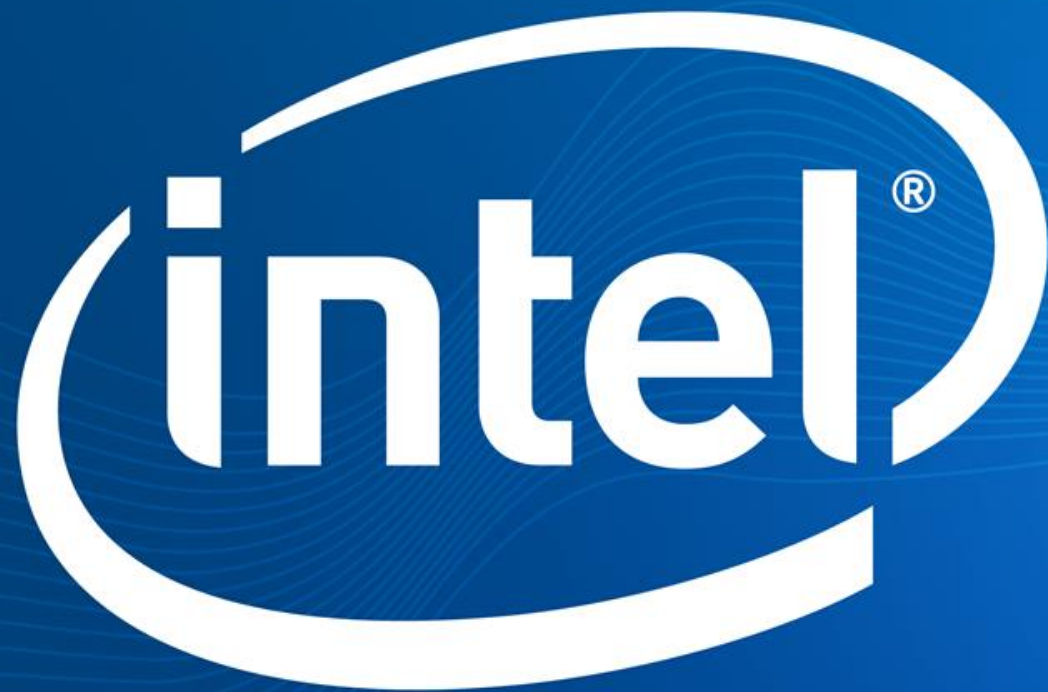
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DISCLOSURES

Intel Technology and Manufacturing Day 2017 occurs during Intel's "Quiet Period," before Intel announces its 2017 first quarter financial and operating results. Therefore, presenters will not be addressing first quarter information during this year's program.

Statements in this presentation that refer to forecasts, future plans and expectations are forward-looking statements that involve a number of risks and uncertainties. Words such as "anticipates," "expects," "intends," "goals," "plans," "believes," "seeks," "estimates," "continues," "may," "will," "would," "should," "could," and variations of such words and similar expressions are intended to identify such forward-looking statements. Statements that refer to or are based on projections, uncertain events or assumptions also identify forward-looking statements. Such statements are based on management's expectations as of March 28, 2017, and involve many risks and uncertainties that could cause actual results to differ materially from those expressed or implied in these forward-looking statements. Important factors that could cause actual results to differ materially from the company's expectations are set forth in Intel's earnings release dated January 26, 2017, which is included as an exhibit to Intel's Form 8-K furnished to the SEC on such date. Additional information regarding these and other factors that could affect Intel's results is included in Intel's SEC filings, including the company's most recent reports on Forms 10-K, 10-Q and 8-K reports may be obtained by visiting our Investor Relations website at www.intc.com or the SEC's website at www.sec.gov.



The image features a dark blue background with abstract, flowing wave patterns in yellow and orange. A bright lens flare is positioned on the right side, partially overlapping the text. The text is centered and reads "INTEL® INNOVATION DAY" in a large, bold, white sans-serif font, with "В РИТМЕ ТЕХНОЛОГИИ" in a slightly smaller, bold, white sans-serif font below it.

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