

Solution Brief

Intel® AI: In Production
AI Vision for Safety



CyberLink Delivers High-Performance Vision for Safety and Analysis

CyberLink optimizes its facial characteristic recognition engine with the Intel® Distribution of OpenVINO™ toolkit



At a glance

CyberLink is leveraging a high-quality, high-performing AI engine, giving users the ability to improve safety through powerful computer vision technologies.

- Enable deep learning algorithms with greater processing power.
- Reduce costs by employing less computing power for the same amount of input.¹
- Optimize performance and process near-real-time data faster with the Intel® Distribution of OpenVINO™ toolkit.

*"By using the Intel® Distribution of OpenVINO™ toolkit, we are seeing up to 5.4x faster performance for the recognition algorithm."*¹

—Richard Carriere, GM & SVP,
Global Marketing, CyberLink

Executive summary

Computer vision technologies have a wide variety of applications and can transform business and improve safety and analysis. As advancements in hardware technology brought market opportunity, CyberLink, an award-winning multimedia company, evolved its expertise in artificial intelligence (AI) to create FaceMe, a powerful AI object recognition engine for edge devices.

FaceMe is a fast, flexible, and precise facial characteristic recognition and mask detection technology that supports the Windows, Linux, Android, and iOS operating systems in multiple hardware configurations. It enables deep learning using the Intel® Distribution of OpenVINO™ toolkit. FaceMe is ideal for usage in public spaces, including offices, retail stores, and cities.

Challenges

Facial characteristic recognition is a worldwide and growing market. By 2024, its market value is estimated to reach more than USD 9 billion.² There are opportunities in the public safety, retail, banking, healthcare, and home safety industries. In particular, offices can use visual recognition to support smart building services, retailers can use it to analyze store traffic, and manufacturers can use it to secure access to machinery and restricted areas. AI-powered recognition solutions can also offer mask detection monitoring for any facility. The engine identifies spoofing or improper use of masks while detecting acceptable face coverings, even if someone is not looking straight into the camera.

Visual recognition requires a lot of processing power, and, initially, CyberLink would enable GPU acceleration to run deep learning algorithms. However, this left out customers using CPU systems and those who needed to run visual recognition smoothly without the higher power needs of GPUs.

Solution

With more than 200 patented technologies, CyberLink is proud of their engineering history and experience and considers it a competitive advantage. When the company decided to focus on AI-driven technologies, they developed FaceMe as an SDK to offer it to a variety of system integrators and solution providers. The FaceMe interface supports HTTP, C#, and C++ , which makes the solution deployable across multiple platforms.

To optimize the FaceMe solution and provide customers with a high-quality, high-performing AI engine, CyberLink turned to the Intel Distribution of OpenVINO toolkit, giving users the ability to process more frames per second (FPS), resulting in higher accuracy with near-real-time detection and characteristic identification. The solution also helps reduce costs for CyberLink's customers because they can now employ less computing power for the same amount of input.¹



1. Source: Internal CyberLink data. Results may vary.

CyberLink also converted convolutional neural networks (CNNs) to the Intel Distribution of OpenVINO toolkit, resulting in a 5.4x performance improvement for object recognition with CPU acceleration.¹ In addition, FaceMe supports GPU acceleration with a vision processing unit (VPU), like the Intel® Movidius™

Myriad™ 2 VPU, to meet specific performance requirements of high-end use cases. FaceMe also supports 3D antispoofing by supporting mainstream 3D cameras, such as Intel® RealSense™ cameras, to prevent photo or video attacks to visual recognition deployments.¹

FaceMe capabilities:

Detection

Generate precise location for objects detected in an image and video stream.

Landmarks

Pinpoint up to 106 high-key characteristics to create animated 3D models.

Recognition

Quickly recognize known characteristics from a database based on feature sets.

Attributes

Instantly analyze recognizable attributes, including emotion and head orientation.

Capitalizing on performance with the Intel Distribution of OpenVINO toolkit

The Intel Distribution of OpenVINO toolkit helps CyberLink deliver powerful AI object recognition even in legacy systems. In one example, CyberLink had a medical device customer with an Intel® architecture-based platform who wanted to deploy FaceMe technology in a medical setting. By running the Intel Distribution of OpenVINO toolkit, CyberLink was able to use the FaceMe SDK to enhance the customer's existing technology to perform at optimum speed.¹

FaceMe SDK

FaceMe for Server_HTTP API	FaceMe for Edge_PC_x64
FaceMe for Server_Windows	FaceMe for Edge_IoT_ARM
FaceMe for Server_Ubuntu	FaceMe for Edge_IoT_Jetson
FaceMe for Edge_Workstation_Windows	FaceMe for Edge_Mobile_Android
FaceMe for Edge_Workstation_Ubuntu	FaceMe for Edge_Mobile_iOS

Figure 1: The FaceMe solution is optimized for servers and edge computing devices in multiple scenarios and hardware configurations.

UNDER THE HOOD: INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT

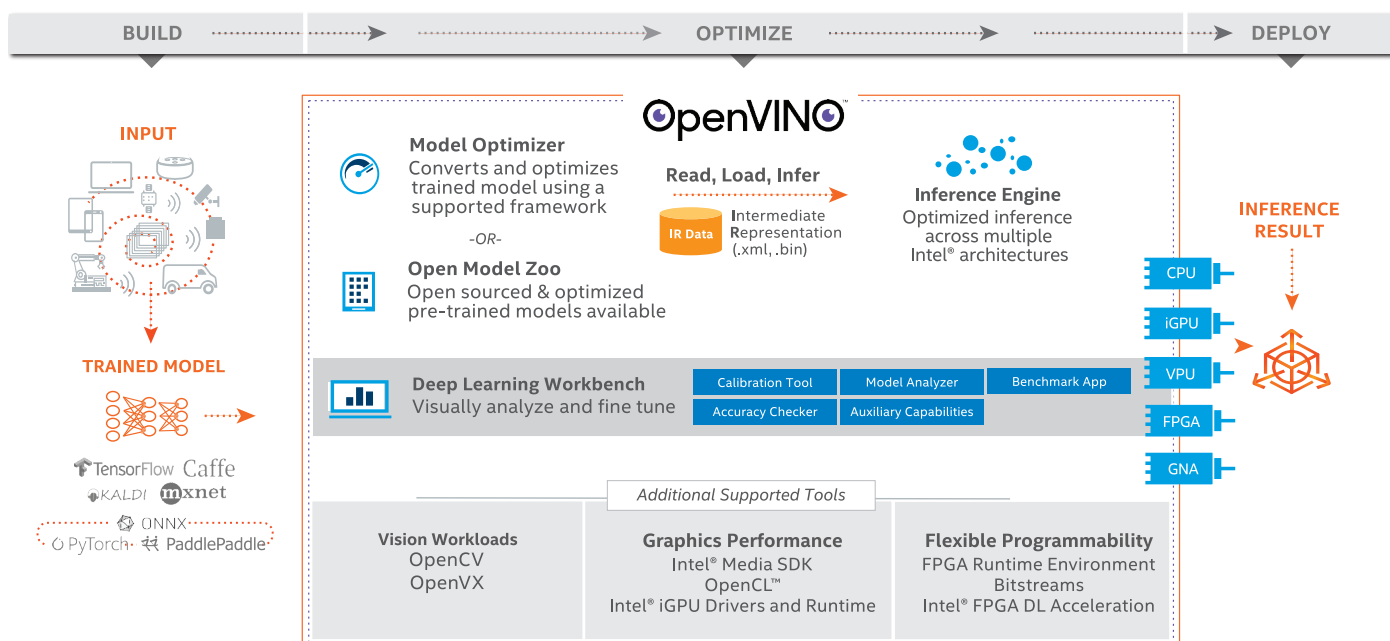


Figure 2: The Intel® Distribution of OpenVINO™ toolkit is a free software kit that helps developers and data scientists speed up computer vision workloads and streamline deep learning deployments from the network edge to the cloud.

1. Source: Internal CyberLink data. Results may vary.

Use cases

CyberLink works with system integrators and solution providers to ethically and legally incorporate the FaceMe solution into a wide range of smart security, smart retail, and smart city applications, while ensuring voluntary participation.

Health screening and mask detection

Confirm that individuals are wearing a mask where it is a requirement, perform accurate recognition even when someone is wearing a mask, and check for elevated body temperatures.

Retail

Generate real-time analytics to measure traffic and gather anonymized demographic data in retail settings.

Business

Track and monitor access to offices and restricted facilities for employees and visitors on an opt-in basis.

Manufacturing

Control access to restricted areas, machinery, and equipment.

Smart home

Integrate FaceMe with smart doorbells and locks for home protection.

Banking

FaceMe supports multiple antispoofing methods to help banking system integrators build smart banking solutions.

Secure antispoofing

Help protect against biometric fraud, e.g., replay attack and print attack, with support for mainstream 3D cameras as well as 2D cameras on phones and tablets.

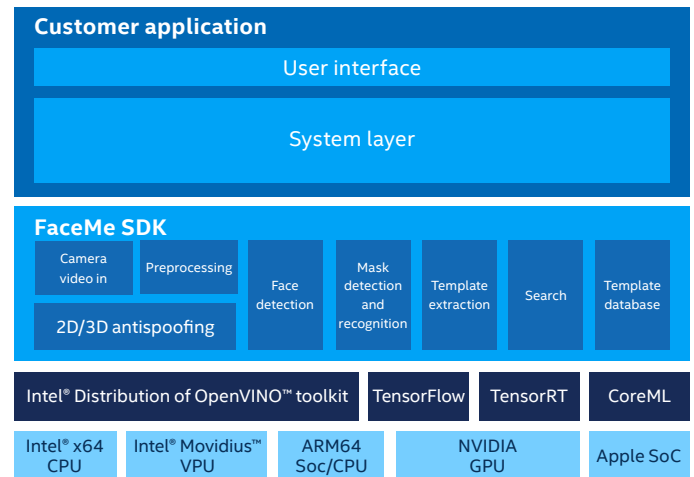


Figure 3: FaceMe architecture

Conclusion

Porting CyberLink's computer vision algorithm to the Intel Distribution of OpenVINO toolkit optimized the FaceMe SDK, resulting in fast, high-performing visual recognition, whether using legacy systems or the latest hardware. CyberLink also works with device makers to run facial characteristic recognition on Intel Movidius Myriad 2 VPUs in industrial PCs (IPCs) in the smart factory, smart retail, and healthcare markets, enabling high performance with low power.

Developers have the ease of using a flexible and precise facial recognition technology they can implement across multiple operating systems, servers, and edge computing devices. As a plug-and-play solution, the FaceMe SDK, coupled with the Intel Distribution of OpenVINO toolkit, shortens time to market, since developers don't have to build an application from the ground up. This makes the FaceMe SDK an exceptional solution for anyone developing deep learning applications.

Make your vision a reality on Intel® platforms

Develop applications and solutions that emulate human vision with the Intel® Distribution of OpenVINO™ toolkit. The toolkit extends workloads across Intel® hardware to maximize performance:

- Enables deep learning inference at the edge.
- Supports execution across a variety of computer vision accelerators, including CPU, GPU, VPU, Intel® Neural Compute Stick 2, and FPGA, using a common API.
- Speeds up time to market via a library of functions and preoptimized kernels.

software.intel.com/en-us/opencvino-toolkit

Accelerate with developer tools

More easily debug, analyze, build, and optimize on Intel platforms

Intel® System Studio provides a unified tool suite that simplifies the building of IoT solutions and embedded apps.

software.intel.com/en-us/system-studio

Improve how you develop, test, and run your workloads

Intel® DevCloud for the Edge provides a cloud-hosted hardware and software platform for testing and optimizing on a cluster of Intel® hardware and software.

software.intel.com/en-us/devcloud/edge

Prototype faster and expedite your path to productization

IoT developer kits and accelerators offer production-ready hardware preloaded with software.

software.intel.com/iot

Explore and evaluate software

Download a wide range of free software tools from the Intel® Developer Zone to help you:

1. Get more from your code.
2. Maximize hardware capabilities.
3. Add competitive features by unlocking the unique technologies in Intel platforms.

software.intel.com

Collaborate with others

Intel® AI: In Production is an ecosystem focused on reducing deployment complexities, promoting partner AI offerings, and increasing collaboration between its partners.

intel.com/ai-in-production

Learn more

Learn more about FaceMe at cyberlink.com/FaceMe.

Learn more about the Intel Distribution of OpenVINO toolkit at software.intel.com/openvino-toolkit.

About CyberLink

Founded in 1996, CyberLink Corp. is the world leader in multimedia software and AI facial recognition technology. CyberLink addresses the demands of consumer, commercial, and education markets through a wide range of solutions, covering digital content creation, multimedia playback, videoconferencing, livecasting, mobile applications, and AI facial recognition. With years of research in the fields of artificial intelligence and facial recognition, CyberLink developed the FaceMe Facial Recognition Engine. Powered by deep learning algorithms, FaceMe delivers the reliable, high-precision, and real-time facial recognition critical to artificial intelligence of things (AIoT) applications.

Learn more at cyberlink.com.



1. Source: Internal CyberLink data.

2. Source: Mordor Intelligence report, <https://www.mordorintelligence.com/industry-reports/facial-recognition-market>.

Notices and disclaimers

Intel is committed to respecting human rights and avoiding complicity in human rights abuses. See Intel's [Global Human Rights Principles](#). Intel® products and software are intended only to be used in applications that do not cause or contribute to a violation of an internationally recognized human right.

Intel does not control or audit third-party data. You should review this content, consult other sources, and confirm whether referenced data are accurate.

Performance varies by use, configuration and other factors. Learn more at www.intel.com/performanceindex.

No product or component can be absolutely secure.

Your costs and results may vary.

Intel technologies may require enabled hardware, software or service activation.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.