CyberLink Delivers High-Performance Vision for Safety and Analysis

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

**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. 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.
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. 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.

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

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

**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 Server_Ubuntu
FaceMe for Edge_Workstation_Ubuntu
FaceMe for Edge_Workstation_Windows
FaceMe for Edge_Mobile_Android
FaceMe for Edge_Mobile_iOS

[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.]

UNDER THE HOOD: INTEL® DISTRIBUTION OF OPENVINO™ TOOLKIT

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.

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.

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

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Customer application

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FaceMe SDK

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Figure 3: FaceMe architecture

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Figure 3: FaceMe architecture

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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.