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Skylum Adds Speed and Intelligence to Image Editing with an AI-Powered Solution

Tapping into the capabilities of the Intel® Distribution of OpenVINO™ toolkit and AI-infused Intel processors, Skylum and Intel have elevated image editing to new levels.

LUMINAR^AI

"Collaboration with the team at Intel allowed us to develop the latest Luminar applications, harnessing the speed, accuracy, and power of artificial intelligence to move the image industry forward. Using Intel's OpenVINO toolkit for inferencing with the capabilities of Intel DL Boost found in the latest Intel processors enabled this release of Luminar to operate nearly twice as fast as our previous TensorFlow-based designs."

– Dimitry Sytnik,
Chief Product Officer, Skylum

Developers of several generations of photo editing applications have followed a similar path, offering richer functionality within increasingly complex user interfaces. While visual communicators have taken advantage of these photo editing tools to create amazing images, the time required for editing and the difficulty mastering the UI controls have been obstacles to a productive workflow.

With Luminar AI, Skylum developers have applied their expertise acquired from prior product releases that enhanced images through AI techniques—including AI Portrait Enhancement and AI Sky Replacement in Luminar 4—to create a comprehensive, fully AI-powered solution: Luminar AI.

Working with Intel support, the Skylum team turned to the Intel Distribution of the OpenVINO toolkit for model optimization as well as inferencing on the client side. These computationally-intensive AI tasks, which are sometimes run in parallel by Luminar AI, are delegated more efficiently on the latest Intel processors through the optimization and tuning provided by OpenVINO toolkit components.

Enabling AI for ISVs

AI is gaining a strong and growing presence throughout the ISV developer community, buoyed by the new tools and techniques being built and utilized by Intel and other leaders in this sector, more effectively harnessing the capabilities of AI technology. Skylum's integration of Intel's OpenVINO toolkit is an example of this trend.

Discussing the importance of AI in Skylum software, CEO Alex Tsepko said this about the AI behind the sky replacement feature, "I think that it is a first step in eliminating manual and boring stuff in photo editing and allowing photographers to focus more on the fun and creativity. We used machine learning to identify different parts of the image and insert the sky where you would like to have the sky. You no longer have to mask things out."[1]

Toolkit Components Geared for Performance

The Intel Distribution of the OpenVINO toolkit gives developers a way to accelerate and enhance AI operations on Intel architecture-based hardware, with distinct advantages on the 10th and 11th gen Intel Core processor family. Intel® Deep Learning Boost (Intel® DL Boost), featured with this processor family, consists of a set of AI instructions that includes the Vector Neural Network Instructions (VNNI). VNNI streamlines deep-learning computations, reducing multiple instructions into a single command that accelerates performance and VNNI also supports INT8 deep-learning inference. Intel DL Boost increases performance in applications built with a number of frameworks, including TensorFlow, PyTorch, PaddlePaddle, Intel Caffe, Apache MXNet, and more.

AI in Action

Skylum ventured into the world of AI and has progressively refined techniques adhering to the company's essential credo: make image editing easy, enjoyable, and naturally expressive. Working together with Intel support staff and open-source toolkits opened a number of pathways to optimize the performance of the latest application, Luminar[AI], allowing it to perform at its full capabilities when running on Intel architecture-based platforms. Skylum was able to take advantage of built-in processor features that streamline AI-specific tasks, such as data inferencing when using the VNNI instruction set.

Performance gains were achieved on the development side when building and optimizing the AI models used by the program and also on the client side when running those optimized models to perform AI tasks. The performance improvements also were reflected in the Luminar[AI] UI, which now offers substantially more response to the user. Further improving the user experience, Skylum developers built automatic filtering into the program to assist in solving specific user problems rapidly without requiring multiple steps in a complex photo editing processes. Many of the AI operations can be accomplished with a single click, such as changing the look of the sky.
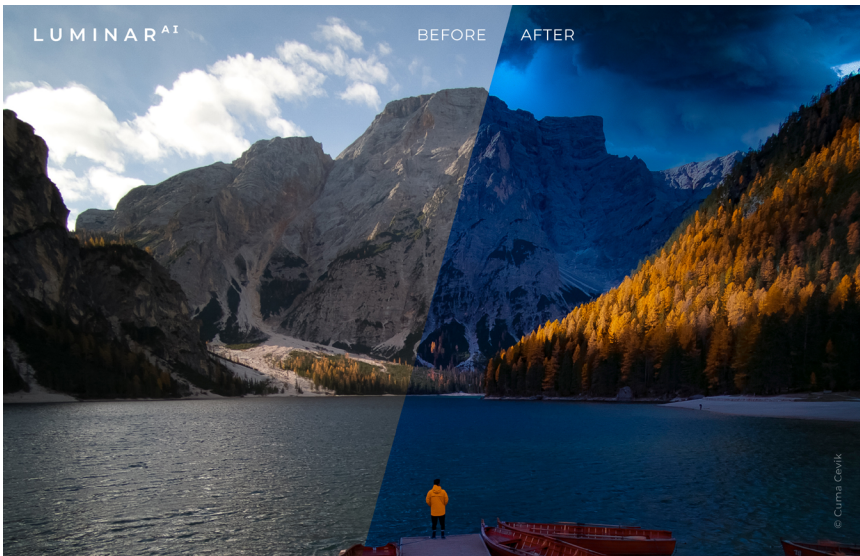
"After deep collaboration between our engineers, I'm excited about Skylum's Luminar[AI], which is now acclerated by Intel DL Boost. Creators using Luminar[AI], on Intel's latest Core processor-based PCs, will experience a truly responsive and intelligent image enhancement software—helping them push the boundaries of their creativity."
– Roger Chandler, VP/GM Client XPU Products and Solutions, Intel

Among the AI-enabled tools in Luminar are:

- **Sky**[AI] – Replace the sky in a photo and shift colors to match the new sky.

- **Composition**[AI] – Intelligently crop images based on the golden rules of composition and pro advice.

- **Face**[AI] – Create natural, pleasing enhancements to facial features.

- **Iris**[AI] – Enhance the appearance of eyes to express moods and personalities.

- **Atmosphere**[AI] – Add realistic effects to a scene including fog, haze, steam, and more.

Figure 1. An example of before and after images using Luminar[AI].

Enabling the AI features in Luminar[AI]

As an integral part of the Luminar[AI] software, the OpenVINO toolkit enables the system to concurrently execute elaborate deep learning algorithms. For example, the Skin[AI] feature uses three disparate models: Facial Landmarks, Skin Detection, and Defects Detection. The data obtained from running these three models concurrently is then used as the basis for the image-editing decisions by Luminar[AI] Portrait[AI] and Skin[AI] correction tools.

Previously, Skylum had used TensorFlow to calculate Deep Learning networks. The switch to using OpenVINO helped the development team achieve results faster, making it possible to process larger amounts of information captured from a photo image.

One of the most demanding, computationally difficult technologies in the program—the operations performed by Composition[AI]—were accelerated approximately 10x through the use of OpenVINO.

Using AI for good

AI technology is quickly evolving toward the first stage of maturity, becoming part of numerous applications. With AI opportunities near at hand, there also is a basic need to address the responsibilities that arise when AI is put to use.

Writing for the *Tech Provider Zone*, Peter Krass said, "Intel is dedicated to using AI for good. That means ensuring that AI technology is not only free of data and human biases, but also safe and secure, inclusive, explainable, respectful of human rights, and monitored with human oversight.[2]

Intel is actively communicating these goals as part of its RISE Strategy, part of the corporate social responsibility initiative. RISE stands for Responsible, Inclusive, Sustainable, and Enabling. The collaboration between Skylum and Intel demonstrates the innovative ways that AI can add new dimensions to a program design and successfully elevate the capabilities of an application to fully exploit available compute resources. The future for AI-enabled applications is bright and Intel is committed to helping organizations and individuals gain maximum benefits while on their AI journey.

Learn more

Skylum Luminar[AI]

Skylum Luminar[AI] is the first image editor fully powered by artificial intelligence. The application is both a standalone photo editor and a plug-in for macOS and Windows, as well as a plug-in for other software applications.

Learn more ›

Intel® Distribution of OpenVINO™ toolkit

This toolkit gives developers easy-to-access libraries, frameworks, and pretrained AI models to speed up AI vision developments for faster time to market.

Learn more ›

About Skylum

Skylum has been making awesome photo editing software since 2009 and has offices in Bellevue, USA; Kyiv, Ukraine; and Toyko, Japan. The company has won numerous awards for its software products over the last decade.

skylum.com

1. *Changing Reality, with Skylum CEO Alex Tsepko*. This Week in Photos. March 2020. https://www.youtube.com/watch?v=ILTZteYZmLk
2. Krass, Peter. *Challenging times call for responsible AI*. Tech Provider Zone. November 2020. https://www.techproviderzone.com/cloud-and-data-centers/challenging-times-call-for-responsible-ai