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Luminar Neo Adds One-Click Simplicity to AI-Driven Image Editing

With the Intel® Distribution of OpenVINO™ toolkit and 12th Gen Intel Core™ processor technology, Skylum and Intel have taken AI to new heights and greater capabilities.
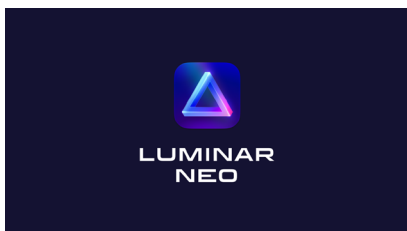
LUMINAR NEO

"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

OpenVINO™

The complexity of user interfaces in photo editing applications has discouraged many visual communicators and created obstacles to efficiently gaining the precise effect intended. Many of these photo editing tools are capable of creating stunning images, but mastering them can be challenging and often impedes productive workflows.

With Luminar Neo, Skylum developers advanced techniques that were pioneered in earlier Luminar versions, expanding the scope of AI-driven effects while also incorporating one-button simplicity into the application. New features added to this release include Relight^AI to control the lighting within a 3D space, Portrait Background Removal^AI and Mask^AI for single-click background removal, and Portrait Bokeh^AI to add precise bokeh effects to an image, regardless of the original lens used and lighting situation. With this release, Luminar Neo complements and extends and refined technique introduced in its predecessor, Luminar^AI.

As part of the ongoing collaboration with Intel, Skylum once again capitalized on the Intel Distribution of the OpenVINO toolkit for optimizing computationally-intensive AI tasks. By employing acceleration and parallelism for complex operations, OpenVINO toolkit takes maximum advantage of the hardware architecture and unique features of 12th Gen Intel Core processor technology.

Unleashing the Power of AI

Throughout the ISV developer community, AI has gained many new adherents and a strong presence in this sector. Aided by the new tools and techniques being developed and supported at a hardware level by Intel and others, the capabilities of AI technology are more accessible and easier to harness. Emphasizing the importance of AI in Skylum software, CEO Ivan Kutanin commented, "We continue to invest in our proprietary AI tools to address new challenges and develop creative solutions which serve both current and future customers. As we expand research and development, our role as an innovation leader in the imaging space will create new opportunities in the broader AI market. The path before us is truly exciting."[1]

Toolkit Components Geared for Performance

The Intel Distribution of the OpenVINO toolkit now includes added support for the 12th Generation Intel Core processor family. The latest toolkit release enabled 12th Gen features, including Intel Gaussian & Neural accelerator (Intel GNA) and Intel GNA generation with native 2D convolutions. Useful capabilities also include Intel Deep Learning Boost (Intel DL Boost), consisting 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, and Intel Caffe.

Built on the Intel 7 process, the 12th Gen Intel Core processor family features a new performance hybrid architecture that accelerates multithreaded operations for streamlining compute-intensive workloads.

AI Optimized for the Hardware Architecture

With the evolution of the Luminar family of image editors, Skylum has ventured deeper into the world of AI, resulting in the easy and highly creative approach to image editing as delivered by Luminar Neo. Co-engineering work with Intel and access to the versatile open-source toolkits gave Skylum a direct path for Luminar Neo[AI] to perform at its full capabilities when running on Intel architecture-based platforms. Neo capitalizes on inherent processor functions that streamline AI-specific tasks, including 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 Neo user interface, which is now streamlined and more responsive.

Figure 1. An example of before and after sky images using Luminar Neo.

Enabling the AI features in Luminar Neo

As an integral part of the Luminar Neo[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.

Support for Layers

From consumer point of view, it may seem a bit of mystery why Skylum introduced another image-editing app when Luminar 4 and Luminar[AI] already have been well received in the marketplace. The short answer is that an upgrade of either of the two predessors could not have been easily accomplished when of the most important new features of Luminar Neo: support for multiple layers in combination with the latest AI capabilities. The addition of layers enables a vast range of complex effects that grant Neo positive recognition as a powerful tool for members of the photography community.

Luminar Neo includes these AI-enabled tools (and more):

- **Layers and AI masking** – Create masks quickly and use layering in new, creative ways.

- **Portrait Bokeh**[AI] – Achieves smooth bokeh backgrounds, simulated depth of field with AI.

- **Relight**[AI] – Compensates for backlit images and recasts the lighting in 3D space.

- **Face**[AI] – Recognizes eyes, skin attributes, and facial features and enhances them using AI.

- **Sky**[AI] – Replace the sky and water in an image, using AI to obtain the desired effect.

- **Portrait Background Removal**[AI] – Detects the subject of an photo and replaces the background with a selected image.

"Every day, Skylum technology is unlocking the potential of our artist community, helping them discover and, at times, rediscover their creative passions. With Luminar Neo, we're excited to bring new and unique abilities to help creators express themselves through compelling images."[2]
– Dima Sytnik, Skylum Co-founder and CPO

Using AI for Good

AI technology is quickly evolving toward the first stage of maturity, becoming part of numerous applications. Today, ethical responsibility for the uses of AI is vital.

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. 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 advancing the technology.

Learn more

Skylum Luminar Neo

Skylum Luminar Neo extends the ground-breaking AI-driven capabilities of the Luminar family of image editors. Designed for one-click editing simplicity, Lumina Neo is tuned for better performance on both Mac and WIndows systems and incorporates some entirely new capabilities for enhancing editing using AI decision-making.

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 New York, USA; Kyiv, Ukraine; and Toyko, Japan. The company has won numerous awards for its software products over the last decade.

skylum.com

1. *Ivan Kutanin appointed Skylum's CEO.* Skylum Newsroom. May 2021. https://skylum.com/newsroom/ivan-kutanin-appointed-as-skylums-next-ceo-alex-tsepko-named-chief-expansion-officer-cxo

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3. 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