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ASX: NVU

Nanoveu Partners with NTU to Advance AI-Powered 3D Technology on Mobile Platforms

Nanoveu executes first licensing agreement with Nanyang Technology University for AI-supported 2D to 3D image conversion

Nanoveu Limited ("**Nanoveu**" or the "**Company**") (ASX: NVU), has entered into a non-exclusive licensing agreement with leading engineering institute, Nanyang Technology University (**NTU**), for proprietary AI processing software that greatly improves the conversion of 2D images and video into compelling 3D content, viewable on Nanoveu's EyeFly3D™ platform.

Nanoveu's EyeFly3D™ product line brings immersive 3D viewing experiences to mobile devices. The AI software algorithms licensed from NTU are expected to greatly expand and improve the visual content available on the EyeFly3D™ platform thereby increasing its commercial appeal.

Highlights:

- Nanoveu has partnered with Nanyang Technology University to license cutting-edge AI processing software, enhancing the conversion of 2D images and videos into high-quality 3D content.
- The proprietary AI algorithms from NTU enable Nanoveu's EyeFly3D™ product line to deliver immersive 3D viewing experiences directly on mobile devices, setting a new standard in mobile entertainment.
- Integration of NTU's AI software is expected to significantly expand the variety and quality of visual content available on the EyeFly3D™ platform, increasing its marketability and consumer appeal.
- Nanoveu is now positioned to capture a larger share of the growing mobile 3D content market.

Technologies:

- Non-Exclusive license with NTU signed on 15 April 2024 (see Appendix A) to use a novel approach developed by NTU to blind face restoration, leveraging a learned codebook and Transformer-based[1] prediction network to generate high-quality faces from degraded inputs, outperforming existing methods in both quality and fidelity.

- The algorithms, when used in combination with Nanoveu's suite of proprietary algorithms, which is currently being enhanced, will enable machine learning-based extraction of important objects and transforming missing areas to produce visually accurate depth perception in combination with Nanoveu's proprietary 3D shading algorithms.

[1] A Transformer-based model is a type of neural network architecture that excels at processing sequences of data, such as text or images. It's particularly well-known for its success in natural language processing tasks, but it's also used in other domains like computer vision. Transformers rely on self-attention mechanisms, allowing them to capture long-range dependencies in data and make predictions based on the entire input sequence. This architecture has achieved state-of-the-art performance in various tasks and is widely used in machine learning and AI applications. <https://aws.amazon.com/what-is/transformers-in-artificial-intelligence/>

- CodeFormer, a robust face restoration algorithm for old photos or AI-generated faces, developed by NTU, will be used in the hole-filling stage of 2D to 3D conversion after segmentation and shifting of foreground segmented cut-outs for image or localised face restoration.
- Nanoveu is currently developing a major upgrade to its 3D technology, creating a pronounced segmentation and depth perception through machine learning.
- Nanoveu AI will now leverage Graphics Processing Unit ("GPU") to create 3D imaging and videos with no reliance on traditional stereoscopic equipment for image and video capture.

3DAI core capabilities will expand NVUs EyeFly3D™ product line by providing:

- Enhanced Depth Perception leading to a more immersive and realistic 3D experience.
- Improved object recognition and tracking, enabling the system to better detect and interact with objects in the environment to fill in natural missing visual gaps.
- Dynamic content adaptation to display content based on real-time environmental factors and user interactions resulting in a more personalized viewing experience.

Alfred Chong, Nanoveu's Managing Director, commented:

"We are excited to announce our first AI licensing agreement with Nanyang Technology University. This partnership marks a significant milestone for Nanoveu and accelerates our leadership in 3D technology for mobile devices.

"By partnering with NTU, a leader in innovation, we reaffirm our commitment to advancing AI-driven 3D conversion technologies for our EyeFly3D™ platform. This collaboration is expected to greatly help expand our reach into augmented and virtual reality.

"Nanoveu's proprietary algorithm to simulate a depth map and NTU's CodeFormer will be used in combination to transform segmented images into a natural form."

EyeFly3D™ and 3DAI

EyeFly3D™

Nanoveu's EyeFly3D™ brings immersive 3D viewing experiences to mobile devices, eliminating the need for glasses when the EyeFly3D™ screen protector, measuring less than 0.1mm in thickness and boasts approximately half a million lenses crafted from scratch-resistant Nano-glass, is applied directly onto smartphones or tablets. Over the past six months, Nanoveu's manufacturing partner has improved this with the creation of a dual stacked lens, to rid inherent "moire" or distortion when viewed in 3D. Complemented by proprietary developed software and app(s) users are given access to a variety of glasses free 3D content via the library within the app which includes videos, images, and interactive experiences.

3D AI Algorithm

Nanoveu's proprietary 3D AI algorithm, once fully developed, (**3DAI**), will represent a step forward in utilising machine learning to assist in automation of 2D to 3D content.

This innovative technology enables the simulation of depth maps with unparalleled precision for a small screen, a pivotal advancement for NVU. Depth maps are fundamental components in advanced 3D technology, facilitating realistic depth perception, stereo rendering, and various real-time and post-processing effects. By harnessing the power of 3DAI, NVU aims to increase the quality and volume of content for its EyeFly3D™ technology.

The integration of 3DAI into EyeFly3D™ software aims to improve 3D viewing experiences, making them more accessible and immersive than currently available. One of the key enhancements brought about by 3DAI is the creation of a profound sense of depth and spatial relationships between objects in a scene. This enhancement not only enhances the realism of 3D content but also significantly boosts user engagement across a wide array of applications, including entertainment, gaming, virtual reality, and simulation.

NVU's strategic integration of 3DAI aims to address existing limitations associated with traditional 3D viewing methods. By imbuing 2D images and videos with a captivating 'pop out' effect of key areas of interest, EyeFly3D™ software powered by 3DAI will deliver an unparalleled level of immersion optimized for mobile and tablet applications, ensuring seamless performance and compatibility across various devices.

Crucially, NVU hopes that adoption of 3DAI technology will eliminate the need for specialized stereoscopic cameras, which are often costly and cumbersome. Currently, 3D video can only be created by deploying expensive stereoscopic cameras, leading to very limited stereoscopic 3D content. 3DAI leverages GPU-driven graphics memory and sophisticated machine learning algorithms to create content for a glasses-free 3D viewing experience. Once developed, NVU's 3DAI software will enable users to convert their own videos in certain key categories that is AI machine learnt, where the 3DAI will segment each scene, extrapolate to create shifted foreground objects and then apply an internally developed hole-filling algorithm to fill in missing segments in the video frame to be able to create 3D content in real time for most scenarios.

NVU's 3DAI algorithm is set to play a pivotal role in stereoscopic 3D rendering, a technique that generates separate views for the left and right eyes to simulate binocular vision. This process relies on depth maps to provide crucial depth information, ensuring accurate parallax rendering and convincing 3D effects. Depth maps are instrumental in enhancing depth perception for viewers, contributing to a more immersive visual experience.

Current depth maps are post-processed effects aimed at enriching the visual quality of 3D scenes. Effects such as depth-based fog, lighting attenuation, and depth-based colour grading leverage depth information to imbue scenes with depth and atmosphere. These enhancements result in improved visual and immersive 3D experiences, captivating viewers and elevating the overall quality of the rendered content. Nanoveu's development to create AI based real-time depth maps for mobile phone scenes is indeed revolutionary.

3DAI Capabilities in the Market

NVU's 3DAI will allow the company to improve and expand its current offering across a variety of industries and market segments.

One area of interest is Augmented Reality (AR) and Virtual Reality (VR), with a resurgence of interest catalysed by ground-breaking advancements like the Apple Vision Pro and Meta's Quest 3. These innovations have propelled the global VR market, with an estimated worth of USD 59.96 billion in 2022 and projected compound annual growth rate (CAGR) of 27.5% from 2023 to 2030[2].

Virtual reality offers users an immersive journey into three-dimensional environments within the real world, revolutionizing experiences across healthcare, gaming, retail, automotive, and entertainment sectors. Nanoveu may leverage 3DAI technology to expand its technology offering into this sector, with potential to unlock a myriad of opportunities across industries, such as virtual training, engineering simulations, healthcare, marketing and collaborative design.

Nanoveu recognizes that there is a shift in utilisation of 3D technologies and 3DAI aims to leverage its current capabilities and evolve to find a fit in the market whilst working to deliver for clients and partners.

This announcement has been authorised for release by the Board of Directors

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[2] Virtual Reality [VR] Market Size, Growth, Share | Report, 2030 (fortunebusinessinsights.com)

About Nanoveu Limited

Nanoveu is a company specialising in protective films and coatings. https://www.nanoveu.com/.

Further details on the Company can be found at
https://wcsecure.weblink.com.au/pdf/NVU/02656570.pdf

Nanoshield™ - is a film which uses a patented polymer of Cuprous embedded film to self-disinfect surfaces. Nanoshield antiviral protection which is available in a variety of shapes and forms, from mobile screen covers, to mobile phone cases and as a PVC commercial film, capable of being applied to a number of surfaces such as door handles and push panels. The perfectly clear plastic film contains a layer of charged copper nanoparticles which have antiviral and antimicrobial properties. This technology is also being applied to fabric applications targeting use in the personal protective equipment sector.

Nanoshield™ Marine prevents the accumulation and growth of aquatic organisms such as algae, barnacles, and mussels on the hulls of ships, boats and other structures that are submerged in water. Nanoshield™ Solar is designed to solve a major issue for solar panels, being reduction of power output from panel surface debris.

EyeFly3D™ - is a film applied to digital displays that allows users to experience 3D without the need for glasses on everyday mobile handheld devices. Customskins - are vending machines capable of precisely applying screen covers to mobile phones with an alignment accuracy of 150 microns.

EyeFyx - currently in the research and development stage, EyeFyx is a vision correction solution using hardware and software to manipulate screen output addressing long-sightedness without the need to wear reading glasses.

Forward Looking Statements

This announcement contains 'forward-looking information' that is based on the Company's expectations, estimates and projections as of the date on which the statements were made. This forward-looking information includes, among other things, statements with respect to the Company's business strategy, plans, development, objectives, performance, outlook, growth, cash flow, projections, targets and expectations and related expenses. Generally, this forward-looking information can be identified by the use of forward-looking terminology such as 'outlook', 'anticipate', 'project', 'target', 'potential', 'likely', 'believe', 'estimate', 'expect', 'intend', 'may', 'would', 'could', 'should', 'scheduled', 'will', 'plan', 'forecast', 'evolve' and similar expressions. Persons reading this announcement are cautioned that such statements are only predictions, and that the Company's actual future results or performance may be materially different. Forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause the Company's actual results, level of activity, performance, or achievements to be materially different from those expressed or implied by such forward looking information.

Appendix A

Information required under Section 4.15 of Guidance Note 8

Parties	Nanoveu Pte Ltd, a 100% owned subsidiary of Nanoveu Limited Nanyang Technological University- Ntuitive Pte Ltd, (Company Registration Number: 199502518G), registered in Singapore
Term of the Agreement	The License will terminate on 14 April 2025.
Nature of the products or services to be supplied by Ntuitive Pte Ltd	A non-exclusive license to use proprietary IP developed by Ntuitive as described in the body of this announcement, allowing Nanoveu to develop products and market and sell the same.
Significance of the contract to the entity	Through the license, the Company will be able to develop AI-driven 3D conversion technologies for its EyeFly3D™ platform, vastly reducing time to market though 3DAI algorithm, as described in the body of this announcement.
Material conditions that need to be satisfied before the customer becomes legally bound to proceed with the contract.	A nominal fee of SGD5,000 is be paid to Ntuitive Pte Ltd as a license fee. All other material conditions have been met.
Other material information relevant to assessing the impact of the contract on the price or value of the entity's securities	Once fully developed, 3DAI will greatly help expand the Company's reach into augmented and virtual reality resulting in increased market opportunities and shareholder value.