2022 WITSA Global Innovation and Tech Excellence Awards
Nomination Form

The 2022 WITSA Global Innovation and Tech Excellence Awards *(*formerly known as *the Global ICT Excellence Awards*) will be presented to select individuals, academic institutions, corporations, NGOsor governments whose use and applications of digital technologies exhibit exceptional achievement within the following broad categories:

Private Sector/NGO	Public Sector
Digital Opportunity/Inclusion Award	Digital Opportunity/Inclusion Award
Smart Cities Award	Smart Cities Award
Sustainable Growth/Circular Economy Award	Sustainable Growth/Circular Economy Award
Innovative eHealth Solutions Award	Innovative eHealth Solutions Award
Public/Private Partnership Award	Public/Private Partnership Award
E-Education & Learning Award	E-Education & Learning Award
Emerging Digital Solutions Award	Startup Ecosystem Award

In addition, a *Chairman's Award* will be presented to a nominee selected from the entire pool of candidates from all award categories.

Candidates for these Awards are nominated by ICT experts from around the world who span over 80 countries/economies. The 2022*WITSA Global ICT Excellence Awards* will take place in conjunction with the September 13-15, 2022 World Congress on IT in Penang, Malaysia (**https://wcit2022.com/**).

Innovative eHealth Solutions Award

Award #1: Individuals, academic institutions, corporations, or NGOs
Award #2: Government authorities

Award Criteria- This Award recognizes Individuals, healthcare institutions, academic institutions, corporations, NGOs or governments that have made remarkable and successful efforts at utilizing ICTs as a tool to promote health and health care such as telehealth, mHealth (mobile health), eHealth or through eLearning, electronic health records, big data, legal frameworks, or social media. Solutions utilized may range from provision of information to keep citizens healthy, to support for public health in communities, care and support systems in health facilities, and from all the above the data needed to inform management and policymakers.

This award also recognizes any companies, individuals, NGOs or other entities who successfully develop or utilize information and communications technology, artificial intelligence, big data or other innovative technologies in the fight against COVID-19. Examples of solutions include vaccine distribution/logistics, vaccine digital certification or other telehealth apps, as well as technologies and solutions which enable productive and safe workspace in the “new normal”.

YOUR NOMINEES (limit three nominations per award category). *Please specify whether the nominee(s) are for the private or public sector category*.

Private/Public Sector:

Private S

Project Name:

SELENA+

REASONS FOR NOMINATION (NOTE: It is important that you make a detailed description of the nominee and why you think the nomination is justified. The absence of a detailed summary of qualifications as they *relate* to the above-mentioned award description will make it difficult for the awards committee to make an appropriate assessment of the candidate):

SUPPORTING INFORMATION: Please send any supporting information to the address above, including information from candidate (i.e. excerpt from program description, web site print-out, press release, etc.)

[Please insertbelow the Product or Solution Synopsis, Impact, Case Studies etc.]

About EyRIS

EyRIS aims to transfigure the delivery of healthcare through AI-powered solutions, with the ultimate goal of being the game changer in the future of first-stage medical diagnostics. Its foray into the healthcare industry focuses on the development and commercialization of innovative products to revolutionize the detection of retinal and chronic diseases in our communities. For more information, please visit: **https://eyris.io/**.

Most recently, EyRIS was humbled to be awarded the Gold award for the Most Promising Innovation at the Techblazer Awards 2021, Singapore's top award that recognizes excellence in the development or adoption of tech solutions, organised by IMDA and SGTech. EyRIS has also been named as the winner of the Digital Transformation Award 2021, specifically in the healthcare category, which was organized by SwissCham Singapore. Lastly, EyRIS is recognized in the Singapore SME 500.

Link towards the article of the Techblazer Awards 2021:
https://www.straitstimes.com/singapore/ai-deep-learning-system-that-dramatically-cuts-diagnosis-time-for-eye-diseases-wins-gold-at-techblazer-awards

Innovative Features and Functionalities

Our flagship product, SELENA+, is an AI that can detect three retinal diseases, diabetic retinopathy, glaucoma suspect, and age-related macular degeneration.

SELENA+ was jointly invented by some of the best researchers around the world, coming from the Singapore Eye Research Institute (SERI) and National University of Singapore (NUS). These institutions are leading research institutions, both in Asia and around the world.

SELENA+ has undergone training and validation using a high-quality dataset of approximately 500,000 images. The results of this study were published in the Journal of American Medical Association (JAMA) in December 2017 as a collaboration with 10 overseas institutions across 6 countries, contributing 70,000 images covering other ethnic groups. Another study was done on the Zambian population, where the AI maintained a high level of accuracy when trialed on a population it was never trained on. This study was published on The Lancet.

JAMA | Original Investigation

Development and Validation of a Deep Learning System for Diabetic Retinopathy and Related Eye Diseases Using Retinal Images From Multiethnic Populations With Diabetes

Daniel Shu Wei Ting, MD, PhD; Carol Yim-Lui Cheung, PhD; Gilbert Lim, PhD; Gavin Siew Wei Tan, FRCSEd; Nguyen D. Quang, BEng; Alfred Gan, MSc; Haslina Hamzah, BSc; Renata Garcia-Franco, MD; Ian Yew San Yeo, FRCSEd; Shu Yen Lee, FRCSEd; Edmund Yick Mun Wong, FRCSEd; Charumathi Sabanayagam, MD, PhD; Mani Baskaran, MD, PhD; Farah Ibrahim, MB, BCh, BAO; Ngiap Chuan Tan, MCI, FAMS; Eric A. Finkelstein, MHA, PhD; Ecosse L. Lamoureux, PhD; Ian Y. Wong, FRCOph; Neil M. Bressler, MD; Sobha Sivaprasad, FRCOph; Rohit Varma, MD, MPH; Jost B. Jonas, MD, PhD; Ming Guang He, MD, PhD; Ching-Yu Cheng, MD, PhD; Gemmy Chui Ming Cheung, FRCOph; Tin Aung, MD, PhD; Wynne Hsu, PhD; Mong Li Lee, PhD; Tien Yin Wong, MD, PhD

IMPORTANCE A deep learning system (DLS) is a machine learning technology with potential for screening diabetic retinopathy and related eye diseases.

OBJECTIVE To evaluate the performance of a DLS in detecting referable diabetic retinopathy, vision-threatening diabetic retinopathy, possible glaucoma, and age-related macular degeneration (AMD) in community and clinic-based multiethnic populations with diabetes.

DESIGN, SETTING, AND PARTICIPANTS Diagnostic performance of a DLS for diabetic retinopathy and related eye diseases was evaluated using 494 661 retinal images. A DLS was trained for detecting diabetic retinopathy (using 76 370 images), possible glaucoma (125 189 images), and AMD (72 610 images), and performance of DLS was evaluated for detecting diabetic retinopathy (using 112 648 images), possible glaucoma (71 896 images), and AMD (35 948 images). Training of the DLS was completed in May 2016, and validation of the DLS was completed in May 2017 for detection of referable diabetic retinopathy (moderate nonproliferative diabetic retinopathy or worse) and vision-threatening diabetic retinopathy (severe nonproliferative diabetic retinopathy or worse) using a primary validation data set in the Singapore National Diabetic Retinopathy Screening Program and 10 multiethnic cohorts with diabetes.

Related article page 2199
Supplemental content

To access the paper: **https://jamanetwork.com/journals/jama/fullarticle/2665775**

Artificial intelligence using deep learning to screen for referable and vision-threatening diabetic retinopathy in Africa: a clinical validation study

Valentina Bellemo, Zhan W Lim, Gilbert Lim, Quang D Nguyen, Yuchen Xie, Michelle Y T Yip, Haslina Hamzah, Jinyi Ho, Xin Q Lee, Wynne Hsu, Mong L Lee, Lillian Musonda, Manju Chandran, Grace Chipalo-Mutati, Mulenga Muma, Gavin S W Tan, Sobha Sivaprasad, Geeta Menon*, Tien Y Wong*, Daniel S W Ting**

Summary

Background Radical measures are required to identify and reduce blindness due to diabetes to achieve the Sustainable Development Goals by 2030. Therefore, we evaluated the accuracy of an artificial intelligence (AI) model using deep learning in a population-based diabetic retinopathy screening programme in Zambia, a lower-middle-income country.

Methods We adopted an ensemble AI model consisting of a combination of two convolutional neural networks (an adapted VGGNet architecture and a residual neural network architecture) for classifying retinal colour fundus images. We trained our model on 76 370 retinal fundus images from 13 099 patients with diabetes who had participated in the Singapore Integrated Diabetic Retinopathy Program, between 2010 and 2013, which has been published previously. In this clinical validation study, we included all patients with a diagnosis of diabetes that attended a mobile screening unit in five urban centres in the Copperbelt province of Zambia from Feb 1 to June 31, 2012. In our model, referable diabetic retinopathy was defined as moderate non-proliferative diabetic retinopathy or worse, diabetic macular oedema, and ungradable images. Vision-threatening diabetic retinopathy comprised severe non-proliferative and proliferative diabetic retinopathy. We calculated the area under the curve (AUC), sensitivity, and specificity for referable diabetic retinopathy, and sensitivities of vision-threatening diabetic retinopathy and diabetic macular oedema compared with the grading by retinal specialists. We did a multivariate analysis for systemic risk factors and referable diabetic retinopathy between AI and human graders.

Lancet Digital Health 2019; 1: e35–44

See Comment page e6

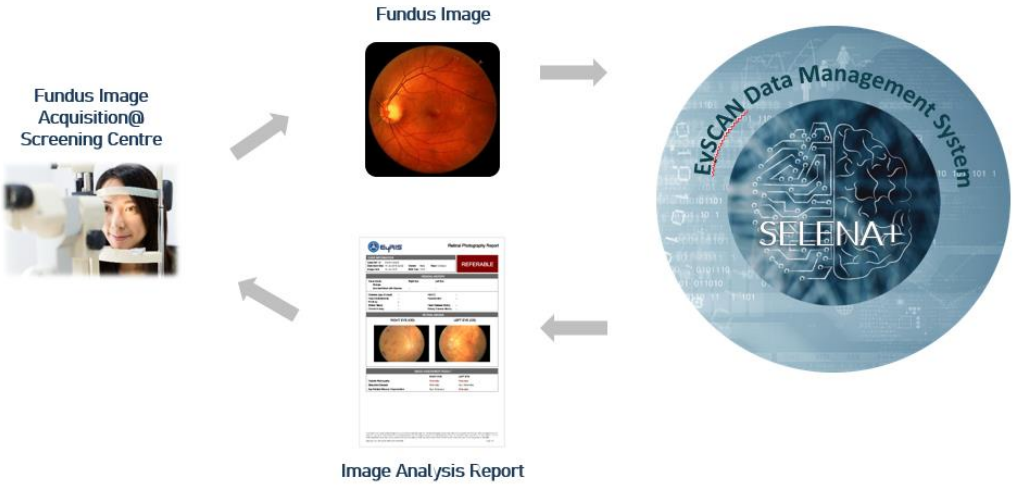
*Contributed equally

Singapore Eye Research Institute, Singapore National Eye Centre, Singapore (V Bellemo MSc, Q D Nguyen BEng, Y Xie MScPH, H Hamzah BSc, J Ho DFST, X Q Lee BSc (Hons), Gavin S W Tan MD, T Y Wong MD, D S W Ting MD); **School of Computing, National University of Singapore, Singapore** (Z W Lim PhD, G Lim PhD, W Hsu PhD, M L Lee PhD); **Ophthalmology and Visual Science Academic**

To access the paper: **https://www.thelancet.com/journals/landig/article/PIIS2589-7500(19)30004-4/fulltext**

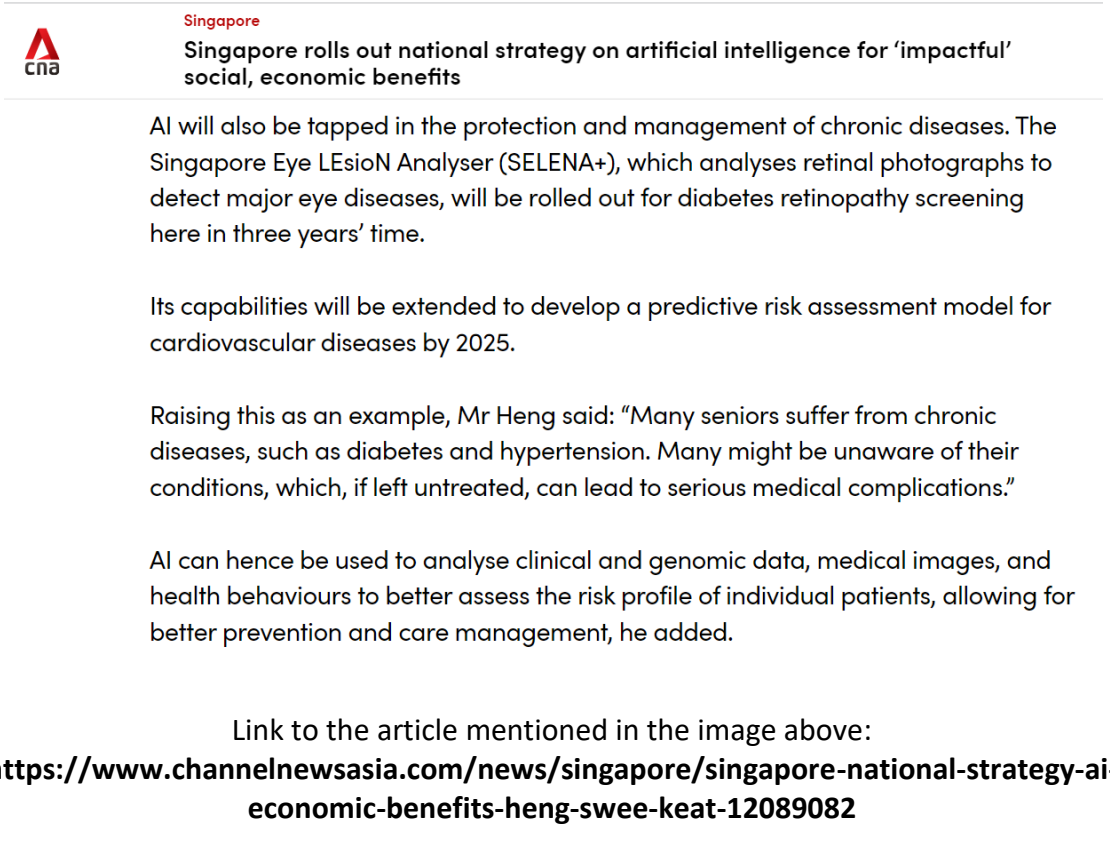
SELENA+ runs on the cloud, giving us the scalability to move across borders. Fundus images can be captured at any acquisition center that has a fundus camera. Subsequently, the images can be submitted into the online AI platform, which is called as EySCAN. From there, it only takes 10-15 seconds to return the findings of the AI analysis.

It has been designed to be easily used during implementing the workflow into any healthcare setting. The system was already tested for scalability and mobility when it was rolled out into non-profit community screening settings both locally and overseas. It has been shown that SELENA+ was easily implemented and improved screening efficiency, thus allowing the non-profit organizations to screen faster, which leads to an increase in the number of patients screened in the community.



Scalability

With the growing diabetes population, the pressure is on healthcare providers to adopt more efficient screening methods. Globally, diabetes affects the lives of more than 530 million adults as of 2021. This problem is only set to grow rapidly, affecting over 780 million people by 2045. Of these diabetic patients, 1 in 3 will develop diabetic retinopathy, which is caused by the rupturing of blood vessels at the back of the eye. This can lead to blindness in about 10% of individuals with this condition, and yet around half of diabetics around the world remain undiagnosed. By using retinal photography, which is the most common and cost-effective diabetic retinopathy screening method, along with the AI with deep learning system (DLS), SELENA+ can become a huge help in decreasing the diabetic population. This leads to the recognition of SELENA+, which is an award-winning product, as one of the projects in the Singapore's National AI Strategy.



Singapore

Singapore rolls out national strategy on artificial intelligence for 'impactful' social, economic benefits

AI will also be tapped in the protection and management of chronic diseases. The Singapore Eye LEsioN Analyser (SELENA+), which analyses retinal photographs to detect major eye diseases, will be rolled out for diabetes retinopathy screening here in three years' time.

Its capabilities will be extended to develop a predictive risk assessment model for cardiovascular diseases by 2025.

Raising this as an example, Mr Heng said: "Many seniors suffer from chronic diseases, such as diabetes and hypertension. Many might be unaware of their conditions, which, if left untreated, can lead to serious medical complications."

AI can hence be used to analyse clinical and genomic data, medical images, and health behaviours to better assess the risk profile of individual patients, allowing for better prevention and care management, he added.

Link to the article mentioned in the image above:
https://www.channelnewsasia.com/news/singapore/singapore-national-strategy-ai-economic-benefits-heng-swee-keat-12089082

Healthcare IT News

Singapore's national AI strategy to focus on chronic disease management and prevention

In the next three years, Selena+, a system which analyzes retinal photographs across the nation for diabetes screening will be deployed.

By **Dean Koh** | November 13, 2019 | 01:51 AM

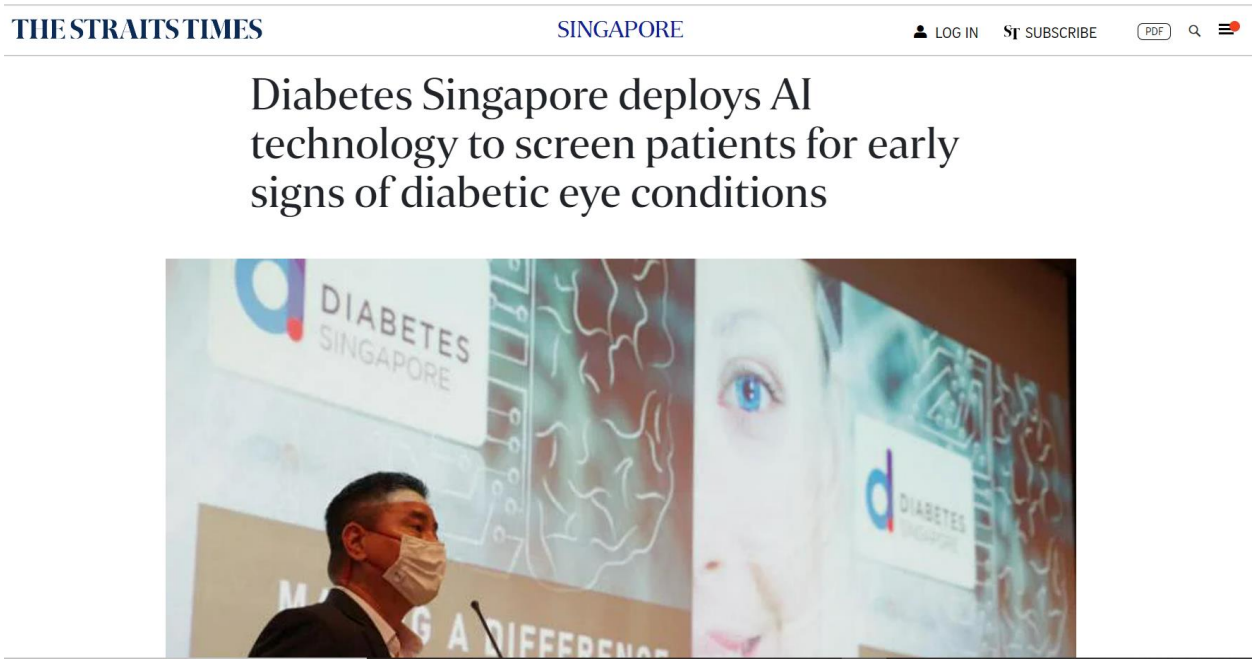
Link to the article in the image above:
https://www.healthcareitnews.com/news/asia-pacific/singapore-s-national-ai-strategy-focus-chronic-disease-management-and-prevention

To add on, EyRIS' will see the use of fundus images to detect other medical conditionsin the near future. This was enabled due to the fact that all humans have a set ofembryonic vessels formed in the brain, kidney, heart, and retina during the embryonic stage of development. Studies have shown that these four organs share the same physiological and anatomical changes, which will be reflected by the change of the tortuosity and sparsity of the embryonic vessels, throughout a human's life. To scan the brain,kidney, and heart, we will require an MRI or CT scan, which is an expensive process with theuse of expensive and space-consuming machines. Thus, it is possible to use the vessels in the retina, as they are the most superficial set of vessels that can be imaged with a much smaller fundus camera, leading to the ability to detect chronic kidney disease by using deep learning AI technology to identify these changes.In the near future, the same technology has the capabilities to be developed to detect cardiovascular diseases and dementia.

Proven Solution

By using SELENA+, patients can get almost instantaneous results instead of waiting for manual readings done by the ophthalmologists after they have done the diabetic retinopathy screening, which is done in polyclinics in the context of Singapore. Furthermore, ophthalmologists can be freed from this manual task to be more focused on their patients, especially due to the fact that SELENA+ has the capacity to pick out **100%** of vision-threatening diabetic retinopathy cases.

The benefit of using SELENA+ can be seen from the work of EyRIS with Diabetes Singapore, which is a part of the International Diabetes Singapore (IDF). They have been using SELENA+ as a part of their workflow in order to showcase EyRIS' work in the field of nursing and diabetes education. This resulted in a reduced procedure times and increased in their productivity, allowing them to screen up to 5 times more patients.

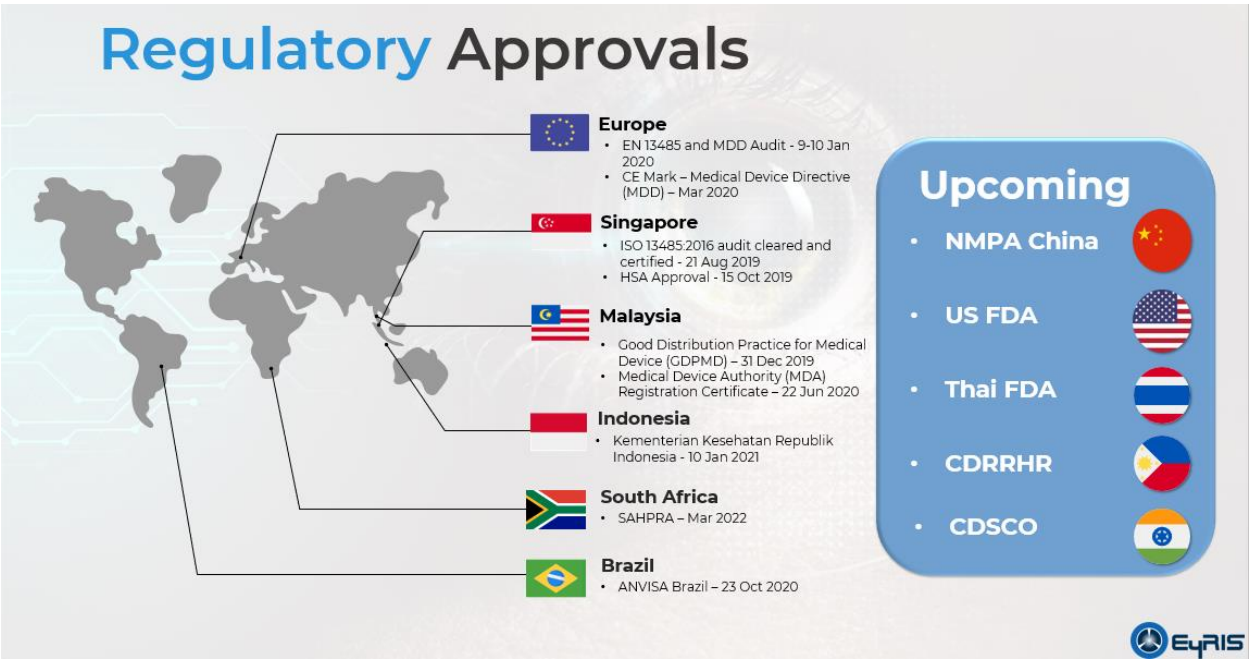


Link to the article in the image above: **https://www.straitstimes.com/singapore/diabetes-singapore-deploys-ai-technology-to-screen-patients-for-early-signs-of-diabetic**

Lastly, SELENA+ was also implemented in the Singapore integrated Diabetic Retinopathy Programme (SiDRP) with effect from early December 2020,which is meant to showcase the adoption of an AI technology within a National Screening Program.

Global Impact

SELENA+ has transcended significant geographical barriers by establishing its presence in 26 countries today, a feat that required careful navigation around various international regulatory approvals. SELENA+ has attained multiple approvals to be used as a medical device, including the Singapore HSA approval and CE mark. It has also achieved regulatory approval in Malaysia, Indonesia and as far as Brazil and South Africa.In the near future, SELENA+ is set to obtain approvals in another 5 regions, including the NMPA in China and FDA in the US.



SELENA+ has been implemented both locally and internationally, spanning private, public non-governmental and non-profit organizations. It has also been adopted into insurance companies and recognized as a screening tool that they reimburse their customers for. Insurance and reimbursements are eager to take this AI technology on as it is proven that early detection is much cheaper than treatment at a later stage for the disease. Human quality of life is also significantly improved if we can prevent vision loss and impairment. Feedback from our partners have been very positive, showing a higher patient throughput, improved efficiency and all leading to greater patient satisfaction.

NOMINEE CONTACT INFORMATION (for award follow up and coordination)
Name: Lisa Gunawan
Job title: Business Development Executive
Email: lisa.gunawan@nova-hub.com
Phone/Mobile: +65 8423 7221