



NUS team wins Dyson award with aid for glaucoma screening



Left: Ms Yu Kelu, holding the award-winning invention, aptly named Hopes (Home Eye Pressure E-skin Sensor), with Mr Li Si (far left) and Mr David Lee.

Above: Mr Lee showing how the device, which consists of a glove with sensors in the fingertip, works. A user would place the "fingertip" at the centre of the eyelid to measure the eye fluid pressure.

ST PHOTOS: NG SOR LUAN

ST SCAN TO WATCH
Pain-free test for glaucoma.
<https://str.sg/dyson17>



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Three National University of Singapore (NUS) students who invented a glaucoma screening device have beaten more than 2,000 entries across the globe to win the international James Dyson Award this year.

The invention, aptly named Hopes (Home Eye Pressure E-skin Sensor), is a glove that uses sensor technology and artificial intelligence to enable patients to check their eye pressure at home.

The award, given out yearly by famous British engineer and inventor James Dyson since 2005, comes with a £30,000 (S\$54,700) prize and worldwide recognition. This is the first time a Singapore team has bagged the top global prize.

The postgraduate students – Ms Yu Kelu, 26, and Mr Li Si, 28, both doctoral students from NUS' materials science and engineering department, and Mr David Lee, 26, a research assistant from the electrical and computer engineering de-

partment – said they were "stunned" to hear about the win from Mr Dyson in a video call.

Ms Yu, who came to Singapore from China at age 15 to study at Tanjong Katong Girls' School and Temasek Junior College, said: "We were told that the judging process was still ongoing and that the panel had more questions."

"So we were shocked when Mr Dyson himself appeared on the video call. And when he told us we had won the top prize, it didn't quite sink in at first. It was only after the call that we realised what a big thing this was. We started cheering and I even cried."

Ms Yu said she was prompted to come up with a solution after seeing the discomfort and inconvenience her 55-year-old father in China went through during frequent eye check-ups after he started losing his vision in 2019.

"My father suffered from constant eye pain and headache. And the process of checking for glaucoma required overnight stays in a hospital and was painful. So I was motivated to delve deeper into the disease and treatment for glau-

coma," she said.

Mr Lee, a Singaporean, said the invention, which arrived after almost a hundred iterations, consists of a glove with sensors in the fingertip.

The user places this at the centre of the eyelid to measure the eye fluid pressure. The captured signals are processed by machine-learning algorithms to map the user's eye pressure with a high degree of accuracy.

The team said about 3 per cent of people over the age of 50 in Singapore have glaucoma, a condition where high fluid pressure in the eyeball damages the optic nerve.

The danger with glaucoma is its insidious nature as it is largely symptom-free, they added. More than 80 per cent of people with the condition were unaware of it at the time of diagnosis. There is no cure, but blindness can be prevented if it is diagnosed and treated early.

The students said the award, besides the generous prize money, has boosted their confidence and encouraged them to press on with further testing and development of the device.

They are planning for clinical tri-

als at the National University Hospital where they will collect and analyse patients' eye pressure data to further train the device's machine-learning mode.

In an interview with *The Straits Times*, Mr Dyson said: "I've experienced first-hand how invasive and unpleasant the tests for glaucoma can be, but it is a vital test."

"Their work has the potential to make glaucoma testing much more widely available and I wish them every success as they navigate the challenging process of further development and medical approvals."

The sustainability award went to Dutch graduate Jerry De Vos, 28, who invented a device that can tell what materials a plastic product is made from by using infrared light to detect the plastic components.

My Dyson said the entries this year were so promising he decided to award a third prize, focused on medical invention. The new award was won by British student Joseph Bentley, 22, who invented a device that reduces catastrophic blood loss from a knife wound.

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