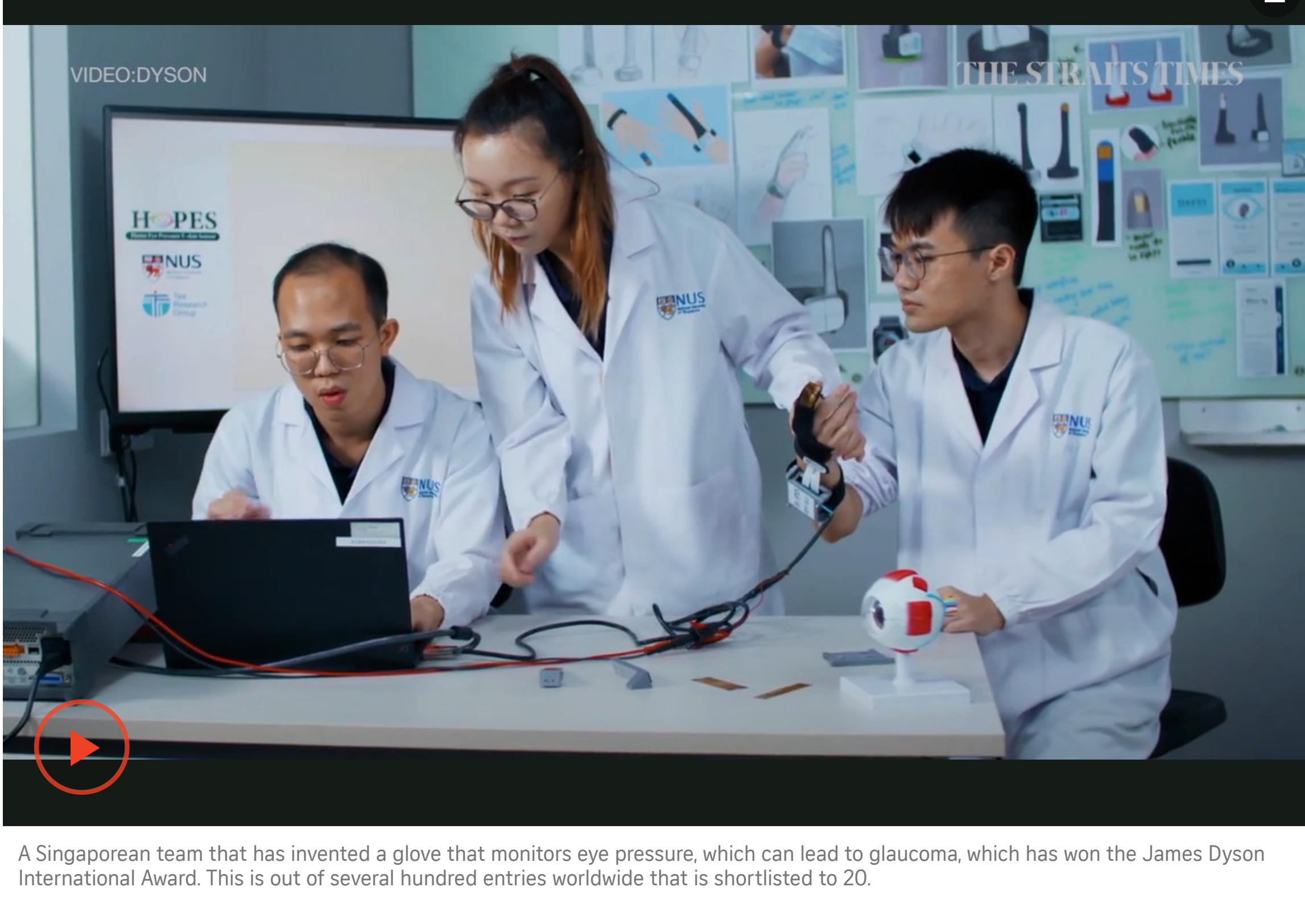


# NUS students win top international James Dyson award with glaucoma screening device



A Singaporean team that has invented a glove that monitors eye pressure, which can lead to glaucoma, which has won the James Dyson International Award. This is out of several hundred entries worldwide that is shortlisted to 20.

Sandra Davie

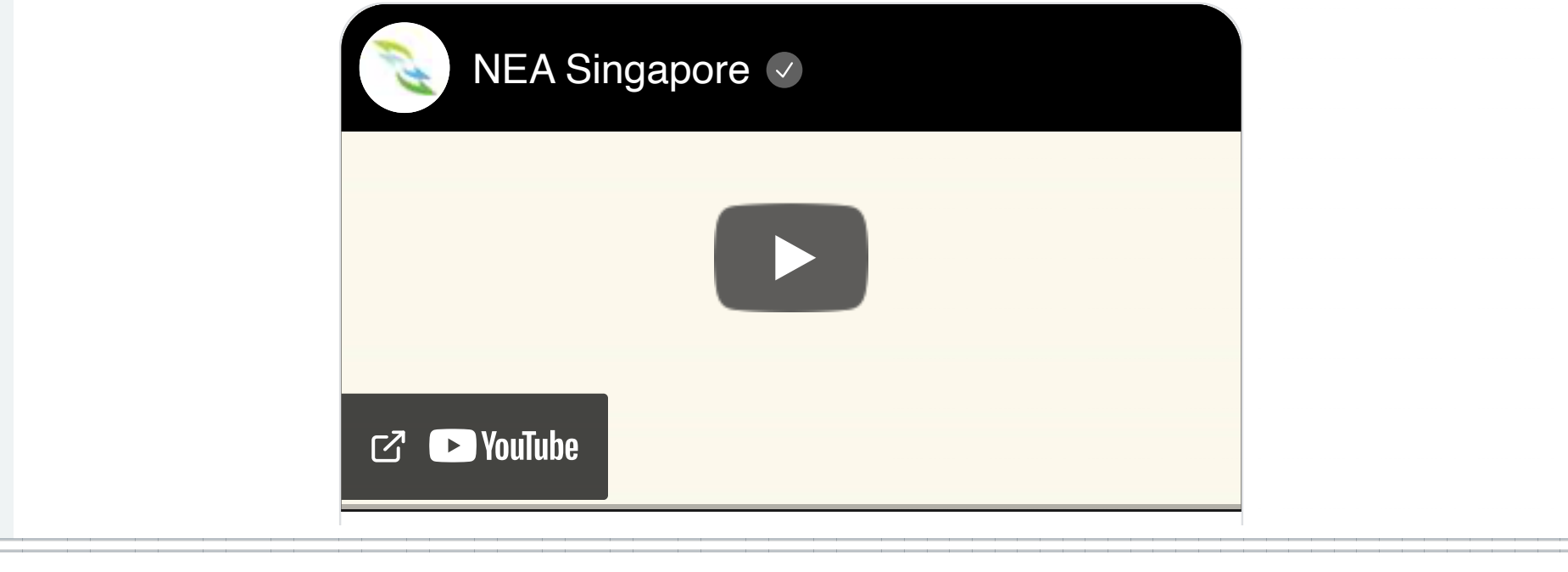
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SINGAPORE -Three National University of Singapore students who invented a glaucoma screening device have beaten more than 2,000 entries from around the world to win the international James Dyson Award this year.

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 £30,000 (\$\$54,700) prize money and worldwide recognition. This is the first time a Singapore team has bagged the top global prize.



The three postgraduate students - Ms Yu Keli, 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 same department - 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 December 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 glaucoma," 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 trials at the National University Hospital where they will collect and analyse patients' eye pressure data to further train the device's machine-learning mode. They are also working on improving the design so the device can be connected to a smart watch.

(From left) PhD students Si Li and Keli Yu and research assistant and graduate David Lee. ST PHOTO: NG SOR LUAN PHOTO: ST

Said Mr Li: "We hope in the future, our device will enable people to measure their eye pressure at home accurately and without any pain. We also hope that one day our research group's sensor technology can be adapted for use in other health monitoring devices."

In an interview with The Straits Times, Mr Dyson commented on the Singapore win: "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.

Mr Dyson, who picks the top winners every year from a shortlist of 20 best entries from around the world, said the entries this year were so promising he decided to award a third prize, focused on medical invention.

The invention, named Hopes, is a glove that uses sensor technology and artificial intelligence to check patients' eye pressure. ST PHOTO: NG SOR LUAN ST PHOTO: NG SOR LUAN

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The new medical award was won by Mr Joseph Bentley, a 22-year-old from Loughborough University in Britain. He invented a device that reduces catastrophic blood loss from a knife wound.

The sustainability award went to industrial and product design graduate Jerry De Vos, 28, from the Netherlands, who invented the Plastic Scanner, a handheld device that, when held against any plastic product, will tell the user what materials it is made from by using infrared light to detect the plastic components.

Mr Dyson, who takes the trouble to inform the top winners of their win personally, said: "I enjoy seeing the enthusiasm with which young people tackle the world's problems using good design, engineering and science.

"Often, they are concerned with problems that affect other people, such as the sick and elderly, and those with disabilities... which is admirable."

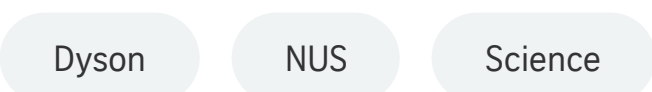
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