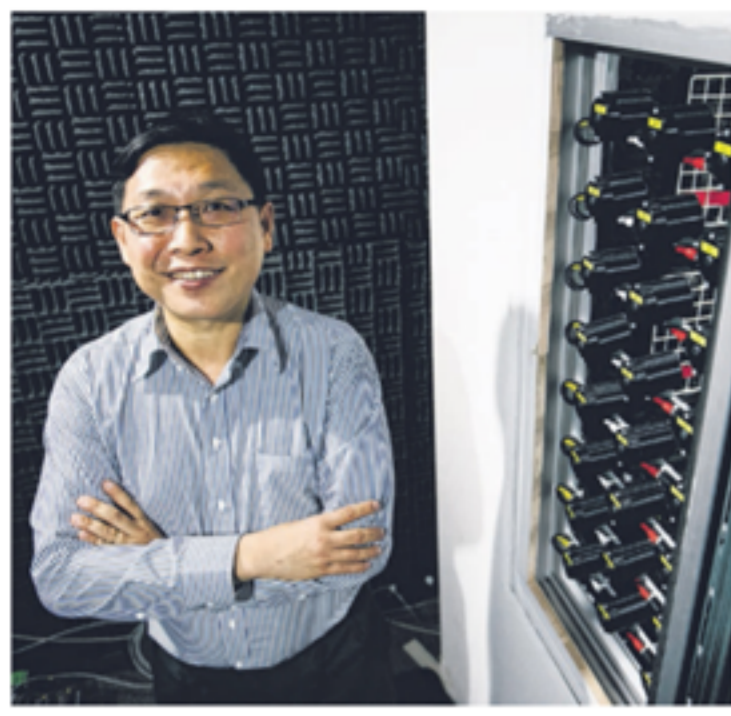


Device to reduce noise from outside



Professor Gan Woon Seng, director of NTU's Centre for Infocomm Technology and the lead researcher of the team that developed the device that can reduce noise pollution entering buildings even while windows are wide open.

WHAT IT IS

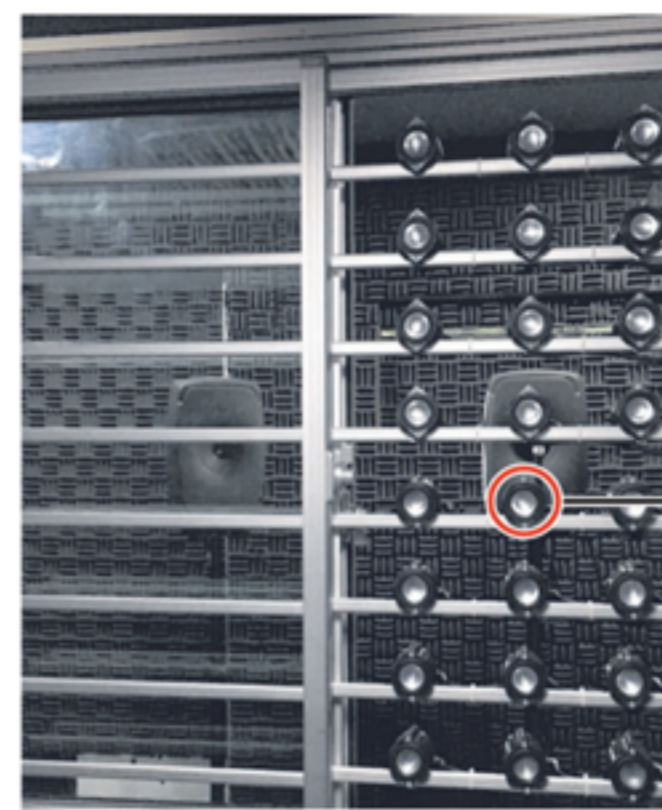
- Designed to be mounted onto window grilles, the device could reduce up to 50 per cent of perceived noise coming from the nearby environment, such as busy roads, train tracks or construction activities.
- The device uses 'active noise control' technology – found in many high-end headphones that cancels external noise – that is adapted to work in a large open area.
- The benefits are two-fold: windows can be left open for fresh air without disturbance from external noise, and the need for air-conditioning to keep the interiors of buildings and homes cool can be reduced.

HOW IT WORKS

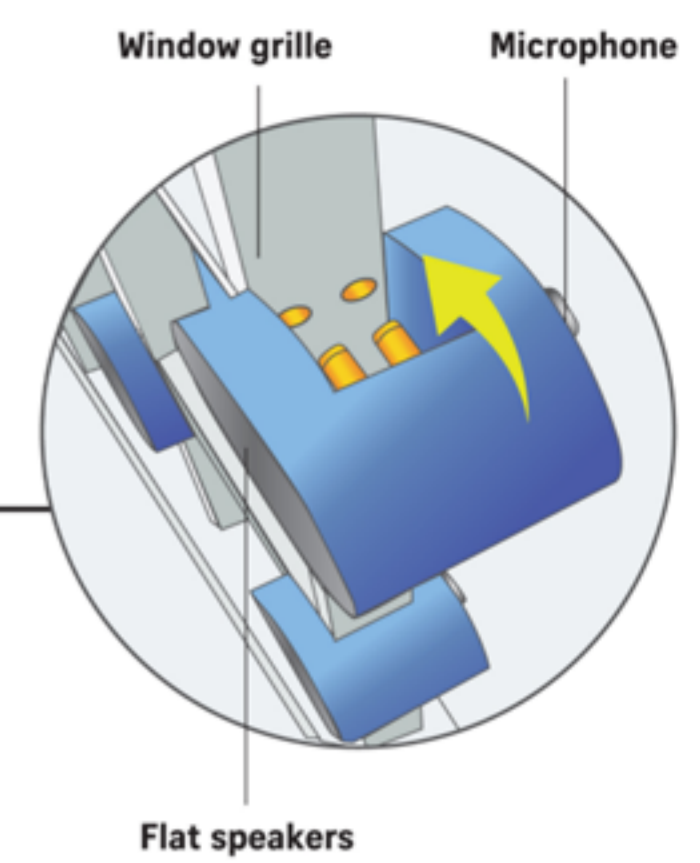


Device

- Microphone picks up external noise. A Central Processing Unit (CPU) connected to the device processes external noise signals in real-time and generates anti-noise signals.
- The noise-cancelling signal is generated into the room interior. Speakers can also play songs or natural sounds to "mask" noise that goes through.
- Researchers hope to reduce the number of devices attached to the window grilles, and integrate the CPU and devices into the design of window grilles after further testing in the next two to three years.



Devices mounted on window grilles



Window grille

Microphone

Flat speakers

Source: NANYANG TECHNOLOGICAL UNIVERSITY. PHOTOS: NANYANG TECHNOLOGICAL UNIVERSITY, ALVIN HO. STRAITS TIMES GRAPHICS

Less noise, even with windows wide open

PUBLISHED 2 HOURS AGO



NTU team developing device using active noise technology, cutting noise by up to 50%

Grace Leong

Noise from busy roads, MRT tracks or construction activity may be less of a nuisance one day even when windows are wide open.

A device is being developed by researchers at Nanyang Technological University (NTU) that can cut down noise by up to 50 per cent.

The device, designed to be mounted on window grilles, uses "active noise control" technology found in high-end headphones that has been adapted for use in large open areas, NTU said yesterday.

While the technology is not new, this is the first time such an experiment is being done on a fully-opened window, it said.

The device uses a special sound-emitting mechanism and is hooked up to a processing unit. Once noise is detected, it emits "anti-noise" sound waves that counter the invading noise, resulting in a softer ambient sound, NTU said.

"Our innovation not only computes the right amount and type of "anti-noise" to emit, but also does it faster than noise can reach inside the building," said Professor Gan Woon Seng, director of NTU's Centre for Infocomm Technology who led the research.

Device to reduce noise from outside



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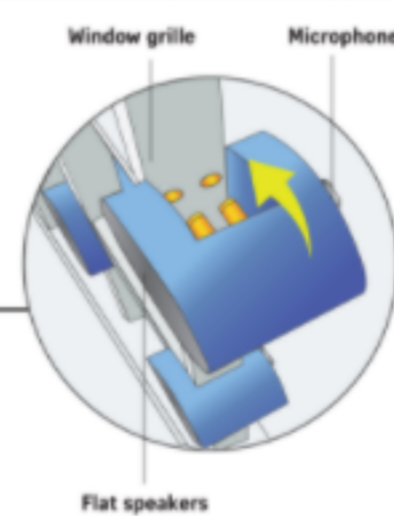


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Devices mounted on window grilles



Window grille

Microphone

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Source: NANYANG TECHNOLOGICAL UNIVERSITY. PHOTOS: NANYANG TECHNOLOGICAL UNIVERSITY, ALVIN HO. STRAITS TIMES GRAPHICS

The team hopes to make it available in commercial or residential areas here in two to three years' time.

Noise is an underestimated threat, Prof Gan said, adding that the World Health Organisation has said it can cause health issues from cardiovascular problems to hearing impairment.

He also said what the team has achieved "is far more technically challenging as we needed to control noise in a large open area, instead of just around the ear".

In the current prototype stage, about 24 devices are being tested in controlled trials.

The next step is to have fewer devices with improved efficiency and integrated into the window grille.

"Our goal is to have as few devices as possible but with the same effect of reducing noise pollution by half, and achieved using the least amount of energy."

Prof Gan noted that double- or triple-paned windows are effective in reducing noise but it would require shutting the windows.

"Our objective is to reduce noise pollution while keeping windows open, and reduce the need for air-conditioning," he said.

The project, supported by the National Development Ministry and National Research Foundation, is in the second phase, with trials done in real environments.

Prof Gan said the technology can be used to keep noise out of vehicles and trains, or confine machinery noise within a factory.

The uniqueness of the technology is that it leverages machine learning to identify the bad sounds from the good, like the chirping of birds, and eliminate those deemed a nuisance, like construction noises, said Prof Gan.

"We are targeting certain types of continuous ambient noise. The device is not a silver bullet for all kinds of noise," he added.

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