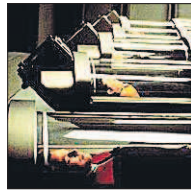


## sci-tech.



## DID YOU KNOW?

Suspended animation is the slowing of life processes by external means without termination; using extreme cold to slow-down an individual's functions. The use of this process has led to the science of cryonics. The technique, however, has never been applied to humans for more than a few hours. Sci-fi, such as *Star Trek*, *Demolition Man* and *2001: A Space Odyssey*, has often referred to it

## IT'S IN THE AIR

Scientists work on a system that will pinpoint passengers who contaminate airline cabins with bio-hazardous agents; believe it could also be used to augment building security

MUMBAI MIRROR BUREAU

In a bid to make air-travel safer and secure from all biological threats, researchers are developing a system that uses mathematical models and sensors to locate passengers releasing hazardous materials or pathogens inside airline cabins.

The technique, which can track a substance to an area the size of a single seat, might enable officials to identify passengers responsible for the unintentional release of germs, such as contagious viruses, or the intentional release of chemical agents in a terrorist attack, said Qingyan Chen, a professor of mechanical engineering at the US-based Purdue University.

"The goal is to be able to track the source if a person released a biological agent, such as anthrax, or inadvertently released a pathogen such as pandemic flu by sneezing," he said.

The research – supported by the Air Transportation Centre of Excellence for Airline Cabin Environment Research, established by US' Federal Aviation Administration – aims to improve air quality and safety inside airline cabins.

The inadvertent release of infectious pathogens inside an aircraft is especially dangerous during lengthy international flights, said Chen, who is a principal director of the centre.

The centre's research focuses on developing mathematical models for software that will be needed to operate such a tracking system and learning how to precisely place several sensors to accurately trace hazardous airborne materials back to the source.

Known as 'inverse simulation', the technique analyses how a material disperses throughout the cabin and then runs the dispersion in reverse to find its origin.

Sensors track the airflow pattern and collect data related to factors such as temperature, velocity and concentration of gases and particles in the air.

"This is difficult to do, because airline cabins are pretty large," Chen said. "The procedure now requires several days of computing time to complete the track, mean-



**Qingyan Chen describes the workings of his Purdue lab, which recreates the passenger area of an airliner. The research aims to develop a system that locates passengers releasing hazardous materials or pathogens inside airline cabins. The technique might enable officials to identify passengers responsible for the unintentional release of germs or the intentional release of pathogens or chemical agents, such as those used in a terrorist attack**

ing the method could be used only after a contamination occurs."

Chen has recreated a commercial airliner's passenger compartment, complete with rows of seating, at a Purdue laboratory.

The lab is equipped with three sensors and recreates the exhalation and body heat of passengers and an airliner's "linear diffuser" environmental control system, which supplies fresh and re-circulated air for passengers.

"Devices located on several seats reproduce body heat, and each has a tube that expels a gas to simulate passengers exhaling. Recreating body heat is important because it affects airflow inside airliners," Chen said.

"Future work will concentrate on speeding

the computation time, with a goal of one day creating a system that alerts pilots in real time to pinpoint a contaminant's source," he added.

The method is most accurate when three sensors are used to track a material. Using three sensors, the Purdue researchers showed that the method could track a substance to within about two feet of its origin in an airline cabin.

"We would be able to tell you the general area of the origin, and from that you could figure out which passenger seats were in this area," said Chen.

The same principle could be applied to systems designed for other environments, such as office buildings, he said.

## Tired of potholes? Do what ants do

REUTERS



**Army ants plugging potholes for other sister ants**

**WASHINGTON:** Army ants tired of potholes take one for the team, throwing their bodies into rough spots to make a smoother road for their sisters, British researchers reported on Sunday.

They found that army ants of Central and South America match their own bodies to the size of the hole they want to plug. Several may plunge together to fill in bigger holes, they report in the journal *Animal Behaviour*.

Scott Powell and Nigel Franks of the University of Bristol studied an army ant species called *Eciton burchellii*, which march across the forests of Central and South America in swarms of up to 2,00,000.

These raiders always remain connected to the nest by a trail of other ants. But this highway of living ants can be extremely uneven as it passes over leaves and branches on the forest floor. So a few of the ants climb into the dips to make a smooth road.

"When it comes to rapid road repairs, the ants have their own do-it-yourself highways agency," Franks said.

"When the traffic has passed, the down-trodden ants climb out of the potholes and follow their nest mates home," Powell added.

"Broadly, our research demonstrates that a simple but highly specialised behaviour performed by a minority of ant workers can improve the performance of the majority, resulting in a clear benefit for the society as a whole."

Powell and Franks conducted experiments in the lab to demonstrate this behaviour.

"We inserted planks drilled with different sizes of holes into the army ants' trails to see how well different sizes of ant matched different sizes of pot holes. Indeed, they fit beautifully," said Franks.

"I think every road user who has ever inwardly cursed as their vehicle bounced across a pothole – jarring every bone in their body – will identify with this story," said Franks.

Most ant species are believed to live in large colonies of sisters, all with the same mothers. Males are also sometimes produced, but only under certain circumstances. **REUTERS**

## website



**WWW.WEEKLYSHOT.ORG**

Today's site is a photo-blog. Every week, a new theme is selected, such as music, night, etc. Photographers post photos of how they interpret the theme. Along the week, people comment and critique the photos; deciding the ones that'll feature on the main page – a great way to look at artist perspectives.

## Computer mouse can cause arm pain

**NEUSS, GERMANY:** Frequent incorrect use of a computer mouse can lead to a condition known as Repetitive Strain Injury (RSI), warn experts.

Tingling, numbness, and weakness in the lower arm and hands are the first signs of overstretching of the tendons and nerves due to monotonous motion," explains Frank Bergmann, head of the German Association of Nerve Doctors.

"Constant clicking using a mouse and an unnatural hand position cause damage to the tissues that over the long term can lead to inflammation of the nerve fibres," Bergmann says.

Even initial, minor symptoms represent a danger that the brain may form connections between the pain and the activity of clicking.

"The mouse click movement on its own can then trigger pain, even if the physical damage in the arm has already

healed," Bergmann points out.

Ergonomic working methods can prevent RSI: Many program functions should be executed with keyboard commands to restrict mouse use. Double clicks should be reprogrammed onto the middle mouse button or the scroll wheel, the neurologist says.

The size of the mouse should also be appropriate for your hand. Cold wrist rests can guard against inflammation. Padded rests for the ball of the hand can also reduce the strain on the arm.

"Stretching exercises, as well as frequent brief breaks help keep the arm musculature relaxed," Bergmann said.

"If symptoms appear like a pulling in the lower arm or pain when weight is put on, go see a neurologist. The longer the delay, the higher the chances that the injury will become permanent," Bergmann says. **IANIS**



**Japanese electronics giant Toshiba unveiled its new multimedia player 'gigabeat V801', equipped with an 80GB hard-disk drive and a 4-inch wide LCD display, enabling a user to store 339 hours of video, or 20,000 music files. Toshiba will put the device, which is capable of digitally broadcasting to mobile gadgets, on the market in June with a price of 59,800 yen (Rs 19,800 approx)**