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ISSN 1475-4738

noise notes is published quarterly by
Multi-Science Publishing Co. Ltd.

5 Wates Way, Brentwood, Essex, UK

Tel: +44 (0)1277 224632 · Fax: +44 (0)1277 223453

email: mscience@globalnet.co.uk · ©Multi-Science Publishing Co. Ltd.

CAR ALARMS

The annoying blare of an ignored car alarm could become a sound of the past if a cooperative, mutable and silent network of monitors proposed by Penn State researchers is deployed in automobiles and parking lots.

“The basis of this system is trust,” says Sencun Zhu, assistant professor of computer science and engineering. “You need to trust the entity that distributes the system’s sensors, so you can rely on all the monitored cars having the goal of protecting your car and others from theft.”

Working with Guhong Cao, associate professor of computer science and engineering, and Hui Song, recent Penn State graduate and now an assistant professor at Frostburg State University, Zhu developed a monitoring system that relies on a network formed by the cars parked in a parking lot. When a car enters a lot and parks, the sensor is alerted - probably when the car door locks - and it sends out a signal that in essence says, “hello I am here.” Sensors in nearby cars acknowledge the signal and incorporate the new car into their network. Periodically, each car sends out a signal indicating that it is still there. When the driver unlocks the car, the sensor sends out a “goodbye” message and the network removes that car, and it drives away.

If, however, a car leaves the network without issuing a goodbye message, the other cars will notice the absence of the “still here” message. Once the system has confirmed that the car is gone, checking that other cars have not received the “still here” message, the monitoring sensor sends a signal identifying the car to the base unit in the parking lot, which will phone the owner to indicate the car is missing. The owner can then check it out.

“Our thought is that the apartment complex owner could provide the sensors with the parking stickers as an additional free perk,” says Zhu, also assistant professor of information sciences and technology at Penn State. “All they need is the base unit, the car owner’s phone number and the sensors in the car for the car should be safe in the lot.”

If a car is stolen from the lot, it is preferable that the theft be noticed and reported before the car leaves the lot, but if it is not, the Sensor network-based Vehicle Anti Theft System, SVATS, has another layer of protection.

Although the main or master sensor needs to be connected to the car’s power system and so is fairly easily disabled by thieves, other slave sensors would be distributed in the car. These sensors might be activated when the master sensor no longer operates and begin to send out an identification signal. The researchers hope to be able to use existing wireless devices that are in intersections and roadsides, to track the sensors in the stolen car. Because the slave sensors are very small, they would be very difficult to locate and destroy, while conventional location equipment, such as various G.P.S systems, can be identified and neutralized.

“Right now the sensors we are testing are about the size of a dollar coin,” says Zhu. “We will eventually make them only about a cubic millimetre, small enough to embed in a parking sticker and very inexpensive to manufacture.”

GLASS & HEARING

Councils should keep collecting glass commingled with other materials despite calls by British Glass to stop, a health and safety expert has advised. Chris Jones, chairman of the Environmental Services Association's health and safety working group, said that commingled collections were better than separate collections of glass, because the noise of glass hitting glass damaged the hearing of operatives. In particular, he claimed that it was not uncommon for operatives to be exposed to 90-100 decibels - way above the 85 decibel limit imposed by law and much higher than noise levels experienced with commingled collections. The comments came at an Environmental Services Association event in London entitled Designing health and Safety into Procurement, and followed concerns by British Glass that increasingly less glass is being recycled into bottles, because it is collected commingled. Mr Jones, who is also director of risk management and compliance for Cory Environmental, said: "We should be looking at collections with reduced or eliminated glass to glass contact. I want to launch a campaign of my own because not commingling glass makes people go deaf," he stressed. Mr Jones explained that the industry had been looking for at least two years at engineering solutions to reduce the noise of glass, but that as yet, there was nothing which could reduce volumes of glass smashing on glass to below a level where hearing protection was necessary.

JET-ENGINE SILENCER

Aircraft noise is a serious problem for the aviation industry particularly during take off and landing near urban areas. Jet engines are a major source of that noise. Now though, Dimitri Papamoschou at the University of California, Irvine, USA, says it is possible to quieten a jet engine by separating its exhaust into high and low speed flows. He says that most of an engine's noise comes from turbulence in the fastest-flowing air. By separating the air into two channels of different speeds he says the noise can be directed upwards, away from the ground and its inhabitants. In simulations funded by NASA Papamoschou found that this technique can reduce the amount of noise heading towards the ground by more than 6 decibels.

SHOUT QUIETLY IN HEXHAM

For almost 800 years sellers at Hexham market (UK) have pulled in the customers by yelling to shoppers wandering through the stalls. But now the local authority, which says it has received several complaints about noise in the Northumberland town, has asked them to keep it down. A spokesperson for Tyneside District Council said the complaints came from businesses with offices above the marketplace. "There have been instances when the noise of the market became more than office workers could cope with," the spokesperson said. "We haven't banned the market sellers from shouting at any time; we have just asked them to quieten down. "We appreciate calling is an important part of their trade but we don't think the restriction will affect everyday trading." The market traders, who pay nearly £1,000 rent for a stall, said the ban would threaten the survival of the market. Fruit and veg trader Martin Foster, 29, said: "It's ridiculous. Hexham's supposed to be a market town. If we can't attract customers, particularly in Winter, the stall might not survive." Fishmonger Carolyn Ridley said: "The traders' cries are part of the colour of the market. "They put on a fabulous display, even though not enough people come here anymore." Attracting shoppers by shouting has been a tradition at Hexham market since it was established in 1239.