

Wi-fi router applications to accurately track and identify all your actions

The researchers found a way to use a Wi-fi router to track people - very accurately.

Currently in cities, people "bathe" themselves in 24-hour Wi-Fi waves. From offices, houses, to the streets, everywhere is filled with **wireless waves** providing services for phones, tablets, laptops, and other devices.

When the devices are connected to the router, they send requests to receive information - weather forecasts, sports news . then the data is required via wireless waves.

In the process of communicating with the device, the router also collects information about how the **signal moves** , whether the signal is blocked by obstructions or noisy. With that data, the router can adjust the parameters to better communicate with the connected device.

But it can also be used to track people - extremely accurately.



When people move in space with signals, their body affects the signal, absorbs some wavelengths and reflects some other waves in different directions.

By accurately analyzing how the signal changes when someone moves in the signal area, researchers can "see" the hand gesture of the person writing, personally identifying based on how they move, Even knowing what they are saying by reading the lip gesture with great accuracy - in many tests this is feasible even if the router is not in the same room with someone.

Some recent experiments focused on the **use of Wifi signals to identify** , or based on their body shapes or body habits.

Freesense system - identify the presence of an owner in a room

Informatics researchers at Northwestern University of Technology in China have studied a system that accurately identifies anyone who passes through the door at an accurate rate of 9/10.

This system needs to be programmed: It needs to remember individual body shapes. After remembering the body shape, the system tracks all those who go through the Freesense area "to see".

If provided with information that the next passerby will be one of the two given, the system recognizes 95% of the tests correctly. If the selection is 6 people, the system correctly identifies with 89%.

Researchers have proposed using the system in a smart home system: If the router sees a person entering the room, it will communicate with devices such as lights, appliances, and automatic curtains - in order to adjust the room according to the preference of the person entering.



Wi-Fi ID system

The Wi-Fi ID system is a Wi-Fi identification system introduced by a team from Australia and UK at a press conference earlier this year.

Wi-Fi ID focuses on identifying people in a small group. It has an accuracy rate of 93% when it needs to be selected in the 2-person group and 77% when the selected group is 6 people.

Scientists believe that the system could become so accurate that it could be alarmed if a stranger entered the monitoring area.

Emerald - System to identify, monitor breathing and heart rate

In 2013, a pair of scientists at MIT confirmed that they could use the router to identify the number of people in the room and identify some simple hand gestures, even if there were retaining walls.

They can measure exactly how many people are in the room, behind a hard wooden door, a 6-inch thick wall with rebar or an 8-inch thick concrete wall and receive messages drawn in the air at a distance of 5 meters from another room with 100% accuracy.

By using more accurate sensors, this MIT team developed systems that are able to distinguish different individuals behind obstacles, and monitor their breathing and heart rate to the extent 99% accurate.

President Obama admired the technology at last year's White House Demo Day. The device called Emerald, a device developed with the aim of helping the elderly by monitoring the trends of body movement and predicting falls before they happen.

WiKey - device that monitors finger gestures on the keyboard

In addition to human recognition and gesture reading, Wifi signals can also be used to identify even the lightest gestures with high accuracy.

A device called "WiKey" presented at a press conference last year is likely to indicate what user is typing through the tracking of finger gestures on the keyboard.

Once installed, WiKey is able to read the text being typed at 93.5%, just using any wifi router and a few special commands.

The researchers discovered how to use a Wi-fi router to accurately track and identify all your actions - Photo 1.

If a hacker has access to the router and installs a similar software - or trickes the user into connecting to a malicious router - he can know what you are typing on your keyboard gently.

The "hearing" system from mouth movement

At a 2014 press conference, UC Berkeley researchers announced the technology is capable of "hearing" what people are saying by analyzing the noise and reflection of the Wifi signal generated by motion. mouth.

This system can read words from the list of words that can be read by lip gestures. The exact ratio is 91% and when only one person speaks, 74% when there are 3 people talking at the same time.

Many researchers publish Wi-Fi sensor technology as a way to protect privacy while collecting important information.

Instead of using cameras that are capable of returning everything that is happening at high detail to collect data - a router system can collect this data without violating too much privacy.

But there are concerns that this technology could be used to steal sensitive data. Project leader WikEy, Kamran Ali said the system only works in optimal conditions and requires a lot of memory settings. " *So, it's not a big security concern.* "

But once this Wifi "eye" technology grows, it can become more radical and work efficiently.

Currently, everything related to wireless signals is everywhere, so these systems will be very easy to be put to use on a large scale once the technology is mature without the need for investment to upgrade. for any new device.

Routers can help protect older people and children safer, record information during the day and make a smart home ecosystem run smoothly - but if used by hackers with bad intentions, they can become very complex tracking centers.

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