

Wireless web access made 100 times better

Local computer scientists have developed software that improves wireless internet connectivity by 100 times and halves the cost.

The software is part of a dynamic wireless access infrastructure network called LAviNet, which uses a set of innovative channel selection and routing algorithms to avoid traffic congestion and reduce signal interference.

Gary Chan Shueng-han, associate professor of computer science and engineering at the **Hong Kong University of Science and Technology**, said the technology more than doubles the rate of data flow, and the signal strength is improved by 100 times.

"Most of the existing wireless solutions are based on installing access points fixed in some places," he said. "In environments with obstructions and blind spots, they don't work well."

A Wi-Fi access point, or hotspot, has a range of about 20 metres indoors and a greater range outdoors. Multiple overlapping access points can cover large areas.

LAviNet is programmed to choose the best channels and paths to minimise interference and maximise throughput, according to Chan. And to address the blind-spot problem, it uses a flexible routing algorithm to switch rapidly to a backup path based on the wireless link quality measured in real time. When a router's connection is weak or disrupted and data cannot be transferred, the system automatically switches to other routers until it finds one that works.

The system can be installed on most Wi-Fi access points and wireless routers without the need to replace the existing costly infrastructure.

Research for the project, which began in 2007, used about HK\$10 million in funding support from the Innovation and Technology Commission.

The system has also been commercialised and used in airports and container terminals, where cabling between access points is "very costly and sometimes even impossible", according to Chan.

Cheng Chung-keung, information technology services manager of cargo firm Modern Terminals, said the technology had helped his firm strengthen its wireless connectivity while halving the cost.

He used to rely on conventional Wi-Fi to process data, but the connection could easily be broken, for instance, when a container occupied the space between the user's computer and the router.

A conventional network covering a range of about two kilometres cost him about HK\$400,000. Cheng said he was considering using the system in other parts of the terminals.