

# Innovation boosts Wi-Fi bandwidth tenfold

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New technology created at Oregon State University can use LED lighting to boost the bandwidth of Wi-Fi systems by about 10 times. Credit: Thanh Nguyen, Oregon State University

Researchers at Oregon State University have invented a new technology that can increase the bandwidth of WiFi systems by 10 times, using LED lights to transmit information.

The technology could be integrated with existing WiFi systems to reduce bandwidth problems in crowded locations, such as airport terminals or coffee shops, and in homes where several people have multiple WiFi devices.

Experts say that recent advances in LED technology have made it possible to modulate the LED light more rapidly, opening the possibility

of using light for wireless transmission in a "free space" optical communication system.

"In addition to improving the experience for users, the two big advantages of this system are that it uses inexpensive components, and it integrates with existing WiFi systems," said Thinh Nguyen, an OSU associate professor of electrical and computer engineering. Nguyen worked with Alan Wang, an assistant professor of electrical and computer engineering, to build the first prototype.

The prototype, called WiFO, uses LEDs that are beyond the visual spectrum for humans and creates an invisible cone of light about one meter square in which the data can be received. To address the issue of a small area of usability, the researchers created a hybrid system that can switch between several LED transmitters installed on a ceiling, and the existing WiFi system.

"I believe the WiFO system could be easily transformed into a marketable product, and we are currently looking for a company that is interested in further developing and licensing the technology," Nguyen said.

The system can potentially send data at up to 100 megabits per second. Although some current WiFi systems have similar bandwidth, it has to be divided by the number of devices, so each user might be receiving just 5 to 10 megabits per second, whereas the hybrid system could deliver 50-100 megabits to each user.

In a home where telephones, tablets, computers, gaming systems, and televisions may all be connected to the internet, increased bandwidth would eliminate problems like video streaming that stalls and buffers.

The receivers are small photodiodes that cost less than a dollar each and

could be connected through a USB port for current systems, or incorporated into the next generation of laptops, tablets, and smartphones.

A provisional patent has been secured on the [technology](#), and a paper was published in the 17th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems.

Provided by Oregon State University

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