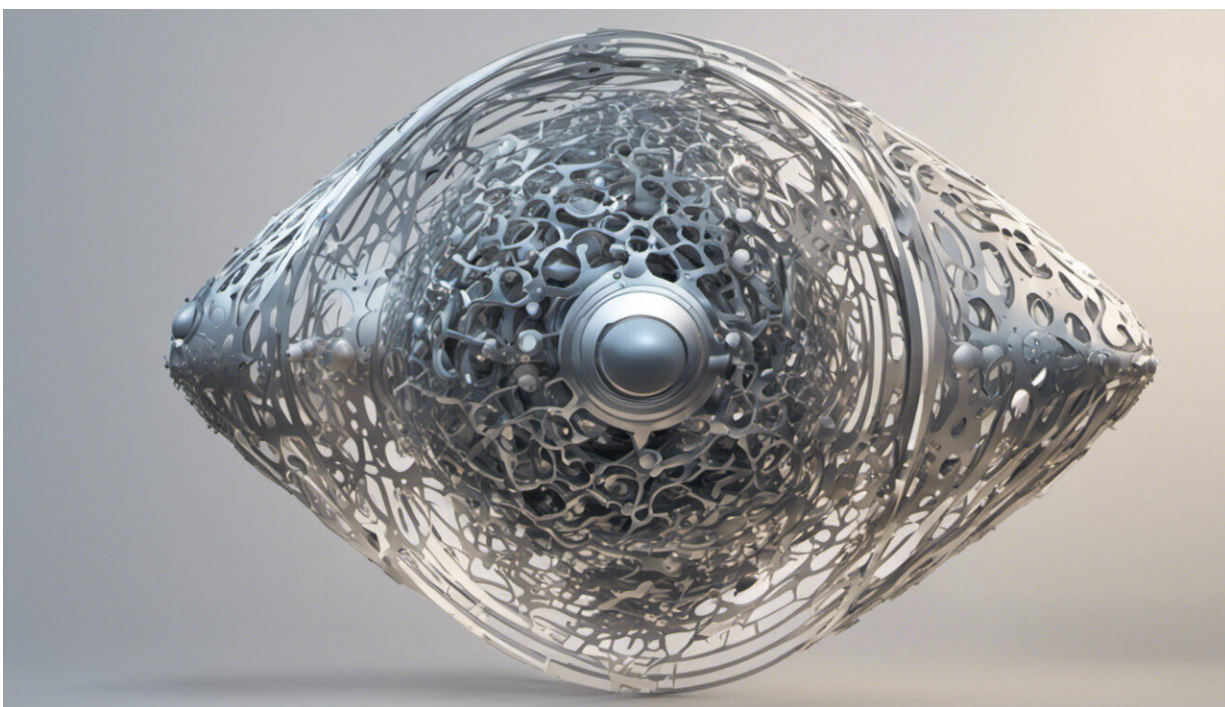


# Real-time 4K video transmission made possible with high-speed millimetre wave technology

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Credit: AI-generated image ([disclaimer](#))

Researchers have developed a millimeter wave (mmW) wireless communication system, enabling long-distance communication and transmitting 4K uncompressed video from a drone in real time.

The advent of 5G broadband will open a whole new range of possibilities, such as 360-degree video streaming and immersive virtual reality applications. Perhaps more important are all the new services that will arise as a result. Imagine a world in which all devices are wirelessly connected, with drones monitoring traffic and assisting in search and rescue missions. A world in which [autonomous vehicles](#) communicate with each other, and wearable devices provide real-time health monitoring and alert doctors in an emergency.

Steps toward such a reality have been taken in the EU-funded 5G MiEdge project launched in 2016. The work done has contributed to the development of a mmW [wireless communication system](#) that has made long-distance [communication](#) possible. Using this system, 4K uncompressed video has been transmitted in real time from a drone. The video transmission system developed has a mmW wireless communication device with a small, light lens antenna that can be fitted to a drone. An additional advantage is the significantly shorter delay compared to conventional compressed transmission.

### **Live drone test on 5G network**

The project team conducted a demonstration in which they used a drone to take video in 4K. The video was transmitted in real time from more than 100 m away to an access point on the ground. In this demonstration, the roadside units (RSUs) used 3-D-LiDAR sensor systems to create a dynamic 3-D map that was shared with other RSUs via mmW communication. The vehicle communicated with the RSU to receive a merged, global, real-time, dynamic 3-D map that extended its area of perception, contributing to better traffic safety and efficiency.

This wireless communication system is based on the technology developed by the project to overcome the weaknesses of mmWs and mobile edge computing (MEC) that have garnered interest for use in 5G

networks. Despite their promising ability to enable high-speed communication, mmWs have high attenuation levels, which means that the radio signal becomes weaker over distances. Another issue was backhauling—getting data to a point from which it can be distributed over a network—since 10 Gigabit Ethernet backhaul can't be provided everywhere. While MEC is capable of bypassing the backhaul networks' limited capacity by making cloud computing capabilities and IT service environments possible at the edge of a network, it has other shortcomings. Namely, reallocation of computation resources isn't easily achieved on demand while still meeting the strict latency constraints expected in 5G networks.

Project partners compensated for each system's deficiencies by combining mmW access and MEC to form the mmW edge cloud, developing a novel control plane that can collect and process user information so that resources can be allocated proactively, and creating a user/application-centric 5G network.

The 5G MiEdge (5G MiEdge: Millimeter-wave Edge cloud as an enabler for 5G ecosystem) technology is being demonstrated in other use case scenarios besides automated driving. One is ultra-fast wireless connection in airports, [train stations](#) and shopping malls to facilitate ultra-high-speed content downloads and massive video streaming. Other scenarios include wireless communication for passengers on trains, buses and planes, public video surveillance and 3-D live [video](#) broadcasts for dynamic crowds in outdoor city areas. The project also intends to showcase its technologies at the 2020 Summer Olympics in Tokyo.

**More information:** 5G MiEdge project website: [5g-miedge.eu/](https://5g-miedge.eu/)

Provided by CORDIS

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