PRESS RELEASE

Source:
SECOM CO.,LTD.
Tokyo Institute of Technology

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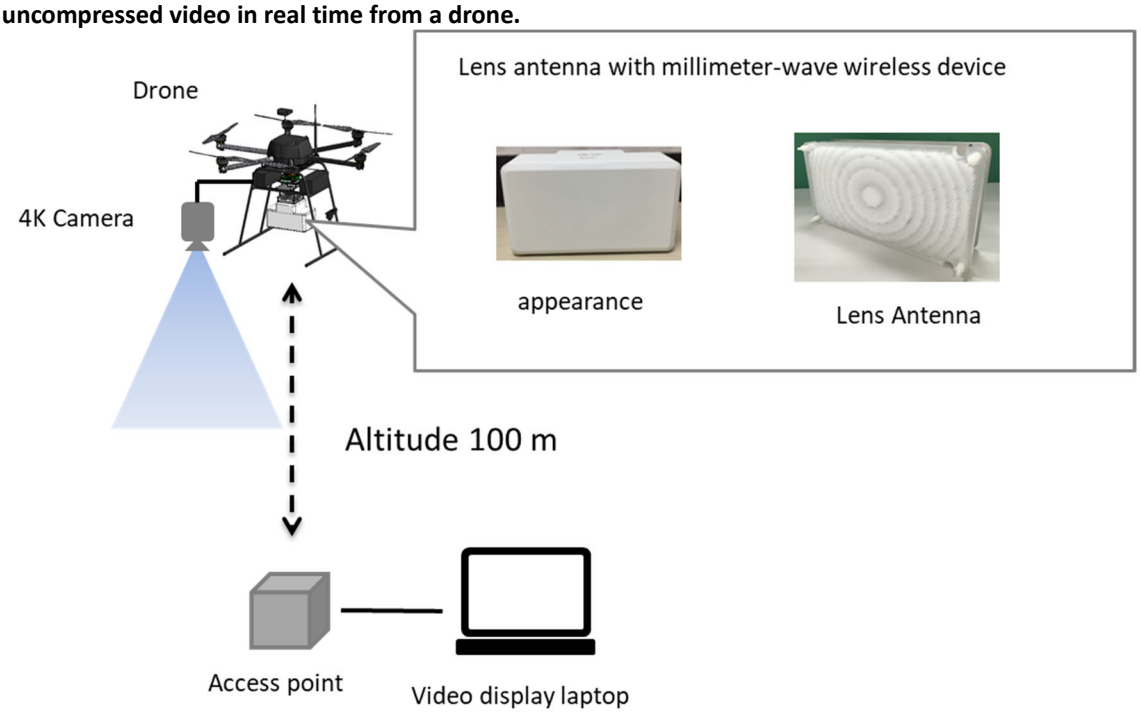
Subject line: Drone transmits uncompressed 4K video in real time using millimeter wave tech
Sub headline: SECOM and Tokyo Tech complete live test on 5G and beyond network

SECOM and Tokyo Institute of Technology (Tokyo Tech) jointly developed a millimeter wave wireless communication system that enables long distance communication, and succeeded in transmitting 4K uncompressed video in real time from a drone.



SECOM is focusing on services for securing wide area facilities by using wireless communication technology for drones. Wide area surveillance with drone requires real time transmission of high definition video such as uncompressed 4K videos providing the professional resolution, for rapid and accurate analyses.

Tokyo Tech has been working on millimeter wave wireless communication systems including 5G-MiEdge[1] project. The research results from 5G-MiEdge project were applied for design and development of the video transmission over millimeter wave wireless links.

Millimeter wave wireless communication is expected to be used in 5G because of the high-speed communication, but there is a problem that communication distance is limited due to large attenuation of radio waves. SECOM and Tokyo Tech have been conducting joint research since 2018 under the framework of the SOFTech[2] Consortium for the development of a millimeter-wave wireless communication device capable of long-distance transmission of images using a lens antenna developed by Intel.

Lens antennas enable long distance communication by narrowing the emission angle of radio waves. However, they have not been used for drones due to their size and weight. To address this problem, the engineering team from SECOM and Tokyo Tech developed a video transmission system with a millimeter wave wireless communication device that uses a small, lightweight lens antenna that can be mounted on a drone. With it, they realized real-time transmission of 4K uncompressed video. Delay using the system is also dramatically reduced compared to conventional compressed transmission.

In their tests, the team was able to use a drone to take video in 4K and transmit the video in real time from over 100 m in the air to an access point on the ground. This technology enables the provision of "safe and secure" services in various fields, such as stadium security, and infrastructure monitoring by drones.

Related links: Transmission Uncompressed 4K Video from Drone through Millimeter-Wave Communication

[1] 5G-MiEdge: Europe-Japan joint R&D project funded by MIC (SCOPE) in Japan and EU (Horizon 2020) in Europe (lead by Tokyo Tech)

[2] SOFTech: Consortium for SOcio-Functional continuity Technology, a project of JST OPERA (lead by Tokyo Tech)

■ Role of each organization
SECOM
Development of video transmission application assuming wide area monitoring with drone, and verification experiment demonstrating quality of communication.

Tokyo Tech
Design of a millimeter-wave wireless communication device using a lens antenna and implementation of hardware

■ Overview of wireless communication system
A drone equipped with a millimeter-wave wireless communication device using a small and lightweight lens antenna transmits 4K uncompressed video in real time from an altitude of 100 m to an access point on the ground.

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