

## News &amp; Comments

# Applications and Challenges of UAV Deployment and Trajectory in Wireless Communication Networks

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In 2022, the total monthly mobile data traffic will be 77 exabytes, and the total yearly mobile data traffic will be close to one zettabyte. In addition, 12.3 billion devices—more than the entire world's population—are anticipated to be wirelessly connected through the Internet of Things and machine-to-machine (M2M) communications for information sharing and utilization because of the proliferation of wireless devices like smartphones and tablets. The fifth generation (5G) technologies have been created to enable the unprecedented use cases and applications needing ultra-reliable high speed and low latency communications as well as huge connectivity, in contrast to the wireless communication systems up to 4G LTE-Advanced. The construction of UAV wireless networks, which sets a communications link condition and an ideal routing protocol, is where most of the problems lie. UAVs are a promising component of 5G and beyond networks for the capacity augmentation over existing networks due to their quick and cost-effective deployment, strong line-of-sight communication link, and great mobility. Multipath fading is less noticeable because of the dominant air-to-air channel feature of the LoS link. A pathloss-dependent large-scale fading with LoS probability can be considered to describe an air-to-air channel since a small-scale fading can be disregarded. UAV will be a crucial part of 5G and future networks, as previously discussed, because of its quick deployment, low cost, and distinct channel characteristics. Less research has been done on UAV RS compared to UAV BS because it can only support a small number of users wirelessly. As base or relay stations to support the increased data rate and huge connection, UAVs are integrated into 5G and beyond networks to increase throughput and expand coverage. The best UAV deployment is crucial, as is making optimum use of radio resources, as the performance of UAV wireless networks greatly depends on their setup. In this research, the communication component for UAV deployment and trajectory is only considered to build UAV wireless networks; nevertheless, the UAV's own limitations, like battery depletion and operation in a GPS-denied environment, should be considered for practical applications.

Source: [Information](#)

## KEYWORDS

5G and beyond wireless communication networks, UAV deployment and trajectory, coverage extension; machine learning

