

## Stochastic Multicast Routing Protocol for Flying Ad-Hoc Networks

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**Abstract :** Wireless ad-hoc network is a decentralized type of temporary machine-to-machine connection that is spontaneous or impromptu so that it does not rely on any fixed infrastructure and centralized administration. As unmanned aerial vehicles (UAVs), also called drones, have recently become more accessible and widely utilized in military and civilian domains such as surveillance, search and detection missions, traffic monitoring, remote filming, product delivery, to name a few. The communication between these UAVs become possible and materialized through Flying Ad-hoc Networks (FANETs). However, due to the high mobility of UAVs that may cause different types of transmission interference, it is vital to design robust routing protocols for FANETs. In this talk, the multicast routing method based on a modified stochastic branching process is proposed. The stochastic branching process is often used to describe an early stage of an infectious disease outbreak, and the reproductive number in the process is used to classify the outbreak into a major or minor outbreak. The reproductive number to regulate the local transmission rate is adapted and modified for flying ad-hoc network communication. The performance of the proposed routing method is compared with other well-known methods such as flooding method and gossip method based on three measures; average reachability, average node usage and average branching factor. The proposed routing method achieves average reachability very closer to flooding method, average node usage closer to gossip method, and outstanding average branching factor among methods. It can be concluded that the proposed multicast routing scheme is more efficient than well-known routing schemes such as flooding and gossip while it maintains high performance.

**Keywords :** Flying Ad-hoc Networks, Multicast Routing, Stochastic Branching Process, Unmanned Aerial Vehicles

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