



## Age of Information Performance in UAV-aided Wireless Networks

Emmanouil Lakiotakis <sup>1#\*</sup>, Nikolaos Pappas <sup>2</sup> and Xenofontas Dimitropoulos <sup>2</sup>

<sup>1</sup> Institute of Computer Science – FORTH

<sup>2</sup> Department of Science and Technology, Linköping University, Sweden

# Presenting author: Emmanouil Lakiotakis, email: manoslak@ics.forth.gr

\* Corresponding author: Emmanouil Lakiotakis, email: manoslak@ics.forth.gr

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### ABSTRACT

Unmanned Aerial Vehicles (UAVs) equipped with wireless communication modules and sensors are widely used in several civilian and military applications enabling over the air exchanging data among remote ground nodes. We consider a system consisting of two remote ground stations that use a UAV-assisted wireless network in order to exchange data packets. Owing to distance, direct communication is not feasible for the ground stations. Thus, a UAV is used to store data from the source ground node and conveys these valuable data by flying to a destination ground station. This communication model is called Load Carry and Deliver (LCAD) and is widely used in single UAV architectures enabling throughput maximization and increased network security. Each ground station should transmit and receive up to a certain number of packets via an error-prone wireless channel due to noise. We investigate the Age of Information (AoI) performance of the system under different parameters, such as the maximum affordable number of packets that the UAV should deliver to the ground stations, the distance between the ground stations, the frequency that each ground station receives data packets and the SNR level in each region that affects the probability for successful transmission. Additionally, we present analysis of the AoI considering these parameters, and finally we provide simulation results that illustrate the impact of the network operating parameters on the age performance.

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