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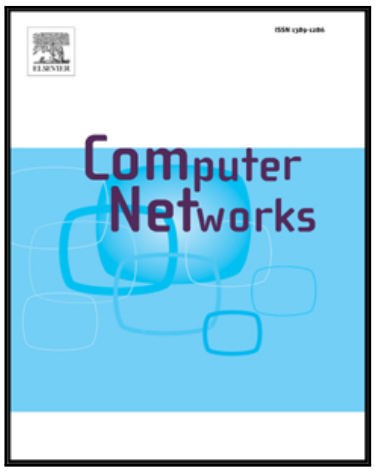

Experimental Characterization of UAV-to-Car Communications

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Experimental Characterization of UAV-to-Car Communications

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Abstract

Unmanned Aerial Vehicles (UAVs), popularly known as drones, can be deployed in conjunction with a network of ground vehicles. In situations where no infrastructure is available, drones can be deployed as mobile infrastructure elements to offer all types of services. Examples of such services include safety in rural areas where, upon an emergency event, drones can be quickly deployed as information relays for distributing critical warning to vehicles. In this work, we analyze the communications performance on the link between cars and drones taking into account the altitude, the antenna orientation, and the relative distance. The presented results show that the communication between a drone and a car can reach up to three kilometers in a rural area, and achieves at least a fifty percent success ratio for the delivery rate at a 2.7 kilometer range. Finally, to allow integrating the communications link behaviour in different network simulators, the experimental results were also modeled with a modified Gaussian function that offers a suitable representation for this kind of communication.

Keywords: VANET, ITS, UAV, GRCBox, Real Implementation.

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