Throughput prediction-based rate adaptation for real-time video streaming over UAVs networks.


Summary: Real-time video streaming is extensively used in UAVs networks for battlefield surveillance, disaster relief, etc. The available throughput of the multi-hop networks varies a lot with the movement of UAVs. To guarantee the video’s quality and continuity, rate adaptation mechanism should be used to choose the appropriate transmission rate according to the varying throughput. In this paper, we propose a novel proactive prediction-based adaptation algorithm to avoid disruptions and provide high quality for real-time streaming over UAVs networks. We show that available throughput varies periodically with UAVs’ mission-related movement. Then we set a prediction range with the knowledge of periodicity gained from the measurements of a training. The raw prediction is further calibrated with reactive estimation of buffered video time to precisely guide the adaptation. Simulation results show that our scheme maintains a continuous playback with a high quality and significantly shorten the start-up delay compared with two constant bit-rate schemes.

Keywords: UAVs networks; knowledge-based prediction; rate adaptation
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