

## NOVEL VIDEO TRANSMISSION NETWORK WITH LOW COST H.264/AVC BASED DISTRIBUTED VIDEO CODING

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**ABSTRACT.** *This paper presents a new wireless video transmission network architecture, which combines our recent proposed low-cost H.264/AVC based Distributed Video Coding (DVC), Digital Video Transcoding (DVT) and Decoding-Friendly Encoder Design (DFED). In this new proposed video transmission network, the DVT is worked directly with the DFED, which is quite different from the conventional DVT, and the DFED is known to have the advantage of simple and efficient decoder. Also, our recent proposed low-cost H.264/AVC based DVC solution, named as the Padding Based DVC, requires lower computational complexity (CC) and hardware cost at the encoder side, compared with the conventional DVC schemes. In fact, it uses pad data (blocks and pixels) at decoder from reference frame for those skip blocks at encoder with sum of absolute differences (SAD) and DC classification. Hence, with the new proposed video network configuration, we could further shift the CC from the portable device to the network side, and this enables us to lower the cost of portable device and the overall video network system. The experimental results for the uplink path show that the proposed scheme can achieve desired video quality and outperform the conventional DVC schemes for most test video sequences.*

**Keywords:** Distributed video coding, Digital video transcoding, Decoding-friendly encoder design

**1. Introduction.** Traditional wireless video transmission networks are basically a store-and-forward network [1], in which the packets of video stream are forwarded hop-by-hop directly, unmodified any contents after video compression processing from a source to a destination. Therefore, it only needs to increase the functions at terminal (portable) device of video mobile telephony system that will easily keep video communication smooth, and is unnecessary to adjust any constraints at network term. With this traditional type of network configuration for video transmission, all computational loading of video communication is done by the terminal (portable) device of video mobile telephony system. In current commercially available mobile phones, high price video functions are still deployed, which contain high priced video compression codec chips (e.g., ITU-T H.26x, ISO/IEC MPEG-x). Naturally, the cost of handset for video communication still keeps high price. To circumvent this problem, in this paper, we present new low cost handset video mobile telephony solution for wireless video transmission network systems, while still maintain desired quality for video communications.