

RESUMO N° 404

LOSSLESS CODING ANALYSIS OF MEDICAL IMAGES SEQUENCES BASED ON HEVC

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Emerging high efficiency video compression methods and wider availability of wireless network infrastructure will significantly advance existing m-health applications. For medical video communications, the emerging video compression and network standards support low-delay and high-resolution video transmission, at the clinically acquired resolution and frame rates. Such advances are expected to further promote the adoption of m-health systems

for remote diagnosis and emergency incidents in daily clinical practice.

Recent advancements in communication systems, like bandwidth increase, have enabled innovative tele-medicine services like remote patient monitoring and diagnosis, medical video conferencing, long-distance consultations, live surgery broadcast for educational purposes, ambient assisted living for old and cognitive impaired people, etc.

In this paper we analyze the tradeoff between encoding time and compression/efficiency testing HEVC Main profile using medical images sequences proposed as reference in [1]. Results have shown that using a combination of coding units (CU) and transform units (TU) on codec configuration file we can achieve up to 75% gain on encoding time with a small impact on compression ratio.

Experimental setup and conclusions

Lossless coding is necessary to allow accurate medical diagnosis [2] and regarding this all tests were conducted under this coding mode.

The tests were conducted for three types of coding constraint conditions:

All Intra, Random access and Low delay

The reference HEVC codec HM 15.0 was used to encode the following sequences: Computed tomography Longrun with 512x512 pixels, Computed tomography Cardiac 512x512 pixels and Angiography Head with 1240x960 pixels.

We've noted that gains on encoding time up to 75% on Random access and Low delay and up to 40% on All Intra coding modes can be achieved using this configuration, with a limit impact on space savings that were recorded on average up to 84%.