**VCEG-BT10**

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| **Question(s):** | 6/16 | | **Meeting, date:** | Hannover, 16-19 October 2023 | |
| **Study Group:** | **16** | **Working Party:** | 3 | | |
| **Source:** | Rapporteur Q6/16 | | | | |
| **Title:** | LS on the compression of biomedical waveform data | | | | |
| **LIAISON STATEMENT** | | | | | |
| **For action to:** | | – | | | |
| **For information to:** | | ISO/IEC JTC 1/SC 29/WG 6 MPEG Audio Coding | | | |
| **Agreement:** | | ITU-T Q6/16 meeting (Hannover, 19 October 2023) | | | |
| **Deadline:** | | – | | | |
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| **Abstract:** | This document is a liaison statement from ITU-T Q6/16 to ISO/IEC JTC 1/SC 29/WG 6 MPEG Audio Coding. It reports on the recent activities of ITU-T Q6/16 regarding the compression of biomedical waveform signals, which have led to the identification of a benchmark technology and the issuance of a Call for Evidence for the compression of biomedical waveforms. |

As discussed with you during our meetings in October 2023 in Hannover, Germany, Question 6 of ITU-T Study Group 16 (known as VCEG) has been investigating the possible development of a waveform coding standard suitable for compressing biomedical waveform data and possibly other waveform signals. This investigation has been conducted in cooperation with DICOM WG32 (Neurophysiology Data).

We have established an Ad hoc Group (AhG) on the coding of medical and general waveform data, with mandates to perform gap analysis, study requirements, collect example signal data for experimentation, produce a draft A.1 justification for development of a Recommendation on the subject, and communicate informally with DICOM WG32 on the above goals.

The AhG has worked to identify an existing reference codec for compressing biomedical waveform data intended to serve as a benchmark for the potential development of new compression technologies. For lossy compression of the biomedical waveform data provided by DICOM WG32, MPEG-D Extended HE-AAC with an MSE-optimized encoding has been identified as a suitable benchmark by the AhG. Initially, two-channel ECG data had been compressed. The results of this initial investigation are described in document **VCEG-BT05**, which is attached to this liaison statement. We were glad to have had the opportunity to discuss the encoding method and the experimental results in this document with your organization in a joint session on 19 October 2023 during the 144th MPEG meeting in Hannover, Germany. We thank you very much for the highly constructive feedback and suggestions provided in this meeting. Our understanding is that it was generally commented that the AhG’s method of operating MPEG-D Extended HE-AAC in an MSE-optimized manner to generate the reported compression results can provide a reasonable anchor for performance benchmarking. Some suggestions were also made for potential further investigations regarding the use of MPEG-4 SLS and the use of MPEG-D Extended HE-AAC with short block length.

We would like to inform you that, following these discussions, Q6/16 has issued a Call for Evidence (CfE) on the compression of biomedical waveform data. Respondents to the CfE are requested to submit responses for consideration at the next Q6/16 rapporteur meeting, to be conducted as a teleconference meeting of 22–26 January 2024. These responses are to include compression technologies and results on compression experiments for three datasets containing Electroencephalography (EEG), Electrocardiography (ECG) and Electromyography (EMG) signals provided by DICOM WG32. As an outcome of the CfE, Q6/16 aims to identify whether technologies exist with compression performance that can significantly outperform the MPEG-D Extended HE-AAC benchmark technology for the considered biomedical application. Following the identification of such evidence, Q6/16 will consider progressing to a Call for Proposals and starting the formal development of a new waveform coding standard. The issued Call for Evidence is attached to this document as **VCEG-BT07**.

Q6/16 would very much welcome your feedback and future collaboration in the design of a coding standard for the compression of biomedical waveform data. In particular, Q6/16 would appreciate receiving technical contributions from members of your organization in the course of this investigation and potential standardization project.

Attachments:

[VCEG-BT05](https://www.itu.int/wftp3/av-arch/video-site/2310_Han/VCEG-BT05-v1.docx) *Information on performance evaluation of audio codecs for 2-channel ECG data*

[VCEG-BT07](https://www.itu.int/wftp3/av-arch/video-site/2310_Han/VCEG-BT07-v1.docx) (Annex B of the Q6/16 October 2023 meeting report) *Call for Evidence on the coding of biomedical waveform data*

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