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Title: **[AHG2][AHG9] Neural network post filter and phase indication SEI messages for AVC and HEVC**

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Purpose: Proposal

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Abstract

Neural network post filter (NNPF) SEI messages, the NNPF characteristic SEI and the NNPF activation SEI, and phase indication SEI messages been developed and incorporated into the VVC draft text and VSEI draft text. On the other hand, AVC and HEVC have not defined those SEI messages in the specifications while they have been widely deployed in various applications [1] and those SEI messages are applicable if the specifications have the corresponding payload type numbers and interface definitions using the normative references. It is proposed to support the NNPF and phase indication SEI messages in the AVC and HEVC specifications.

Introduction

Neural network post filter (NNPF) SEI messages [2] can be used in various applications as it has capability of general visual quality improvement, chroma upsampling (from the 4:2:0 chroma format to the 4:2:2 or 4:4:4 chroma format, or from the 4:2:2 chroma format to the 4:4:4 chroma format), resolution resampling (increasing or decreasing the width or height), picture rate upsampling, bit depth upsampling (increasing the luma bit depth or the chroma bit depth), colourization and those combinations.

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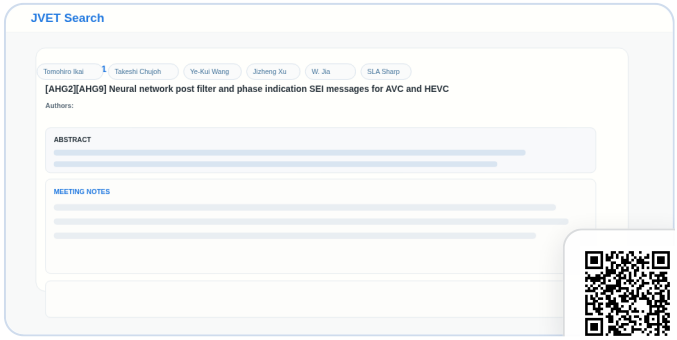

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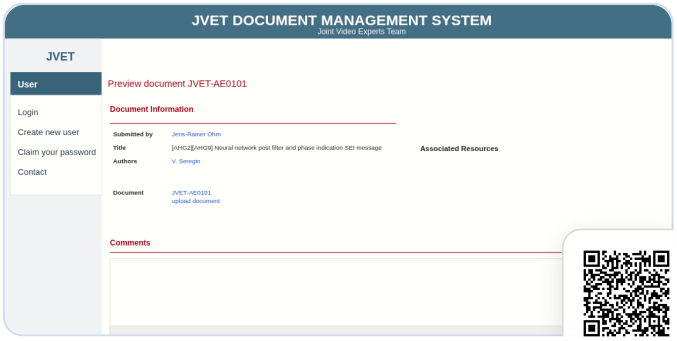

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MEETING NOTES

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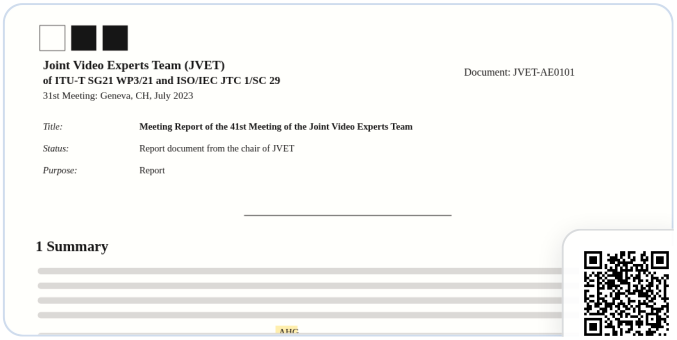

MEETING NOTES

JVET-AE0101 [AHG2][AHG9] Neural network post filter and phase indication SEI messages for AVC and HEVC [T. Ikai, T. Chujoh (Sharp), Y.-K. Wang, J. Xu, W. Jia (Bytedance)]

This was discussed in JVET on Friday July 14.

Neural network post filter (NNPF) SEI messages, the NNPF characteristic SEI and the NNPF activation SEI, and phase indication SEI messages been developed and incorporated into the VVC draft text and VSEI draft text. On the other hand, AVC and HEVC have not defined those SEI messages in the specifications while they have been widely deployed in various applications and those SEI messages are applicable if the specifications have the corresponding payload type numbers and interface definitions using the normative references. It is proposed to support the NNPF and phase indication SEI messages in the AVC and HEVC specifications.

A new edition of H.265 is planned to be submitted for ITU consent, but it would be premature to include by last minute, and the corresponding edition 5 of 23008-2 is already under FDIS ballot.

> According to opening remarks, another edition of H.265 could be submitted in April 2024, and the three SEI messages (NNPFC, NNPFA, phase indication) should be enabled in that. It was agreed to implement this by establishing a link to VSEI (v3). Another edition of 23008-2 could be initiated for 2024 once it becomes clear that the 5th ed. would be published in 2023. At this moment, an amendment (CDAM1) on top of the 5th edition could be started, which would contain the colour descriptors from JVET-AD1008, and the proposed text from JVET-AE0101 (possibly some refinements). Decision: This was agreed.

According to opening remarks, another edition of H.264 could be submitted in April 2024. Furthermore, it is planned to start working on the 11th edition of 14496-10, with CD at this meeting. This should include various corrigenda items from JVET-AD1004, the colour descriptors from JVET-AD1008, and the proposed text from JVET-AE0101 (possibly some refinements). This was

> Further study should be performed if other SEI messages existing in HEVC and VSEI should also be included in AVC. Decision: This was agreed.

> It was noted that inclusion of new SEI messages in HEVC and AVC also requires software implementation in HM and JM, respectively.

CITATION

T. Ikai, T. Chujoh, Y.-K. Wang, J. Xu, W. Jia, "[AHG2][AHG9] Neural network post filter and phase indication SEI messages for AVC and HEVC", JVET-AE0101, 31st Meeting: Geneva, CH, July 2023.