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Title: **QP-independent and slice type-independent initialization of context models for the high throughput CABAC mode of JVET-P0300**

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Purpose: Proposal

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Abstract

A QP-independent and slice type-independent initialization method is proposed for the high throughput CABAC mode of JVET-P0300. This opens up the possibility for simplifications in a hardware or software implementation. For example, instead of deriving a context model index (for a certain bin), the context model state (which corresponds to a probability value) can directly be derived. For QPs 2-17, the BD-rates are 4.96% for AI, x.xx% for RA, % for LB, and % for LP. For the lossless setup, the bit rates increase by 7.78% for AI, % for RA, and 6.78% for LB.

Proposed method

The high throughput CABAC mode of JVET-P0300 maintains per context model two variables valMpsGB and pShiftGB. These represent a probability value for arithmetic encoding of associated bins (see JVET-P0300 for details). More precisely, the derivation of the LPS in the arithmetic coding engine employs a simple bit shift as follows:

valMps = valMpsGB ivlLpsRange = ivlCurrRange >> (pShiftGB + 1)

Instead of deriving variables valMpsGB and pShiftGB of a context model from a (slice type-dependent) initialization value and the QP, it is proposed to fix one value for valMpsGB and pShiftGB per context model. By appropriately choosing values for valMpsGB and pShiftGB, this implicitly corresponds to a context reduction and it may simplify context derivation rules.

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JVET-Q0461

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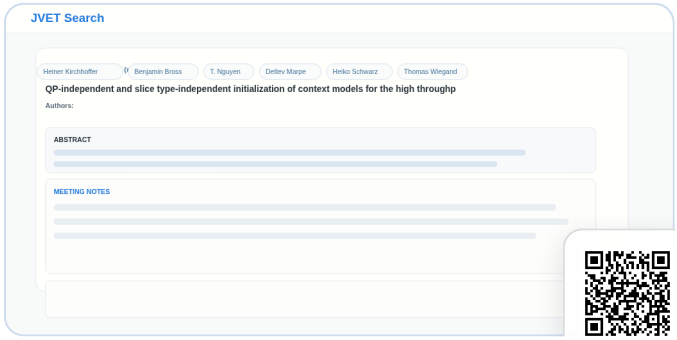

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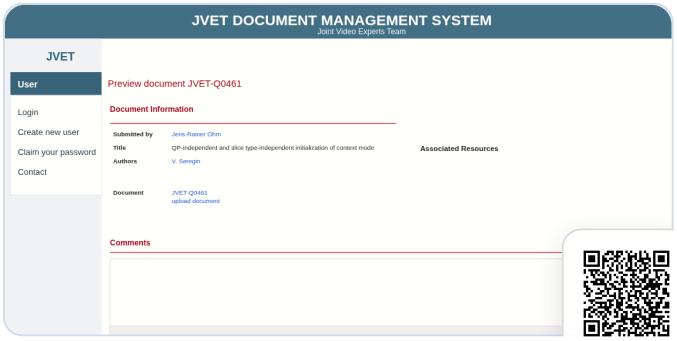

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MEETING NOTES

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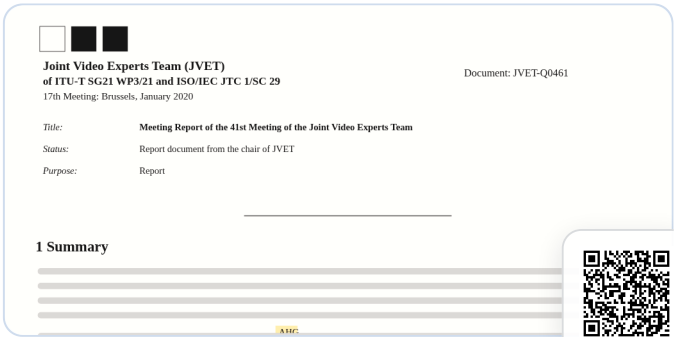

MEETING NOTES

JVET-Q0461 QP-independent and slice type-independent initialization of context models for the high throughput CABAC mode of JVET-P0300 [H. Kirchhoffer, B. Bross, T. Nguyen, D. Marpe, H. Schwarz, T. Wiegand (HHI)]

A QP-independent and slice type-independent initialization method is proposed for the high throughput CABAC mode of JVET-P0300. This opens up the possibility for simplifications in a hardware or software implementation. For example, instead of deriving a context model index (for a certain bin), the context model state (which corresponds to a probability value) can directly be derived. For QPs 2-17, the BD-rates are 4.96% for AI, x.xx% for RA, 5.37% for LB, and 5.72% for LP. For the lossless setup, the bit rates increase by 7.78% for AI, 7.34% for RA, and 6.78% for LB.

> Further study and better understanding of the problem is needed before considering specific technology. See notes under JVET-Q0387.

CITATION

H. Kirchhoffer, B. Bross, T. Nguyen, D. Marpe, H. Schwarz, T. Wiegand, "QP-independent and slice type-independent initialization of context models for the high throughput CABAC mode of JVET-P0300", JVET-Q0461, 17th Meeting: Brussels, January 2020.

REFERENCES

1. F. Bossen, J. Dong, H. Kirchhoffer, "Description of Core Experiment 1 (CE1): CABAC Initialization", JVET-N1021, 14th Meeting: Geneva, March 2019.
2. H. Kirchhoffer, D. Marpe, B. Bross, T. Nguyen, C. Rudat, H. Schwarz, T. Wiegand, "High throughput CABAC mode for VVC", JVET-P0300, 16th Meeting: Geneva, October 2019.