

JVT-T054: Signaling FGS NAL unit

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research & development

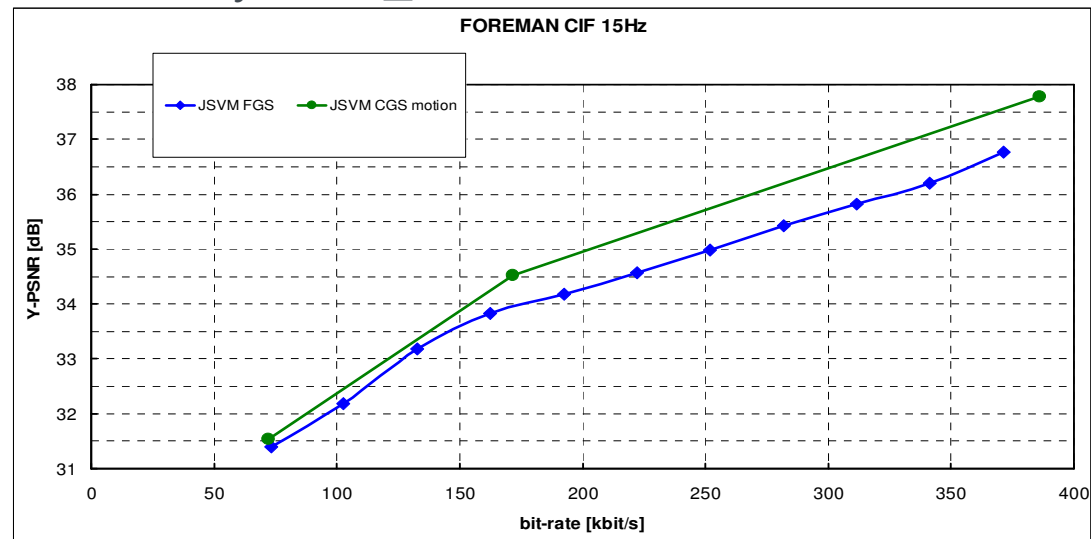


Outlines

- Brief review of JVT-S044: Enhanced SNR scalability for layered CGS coding using quality layers
- Signaling FGS NAL unit
- Recommendations

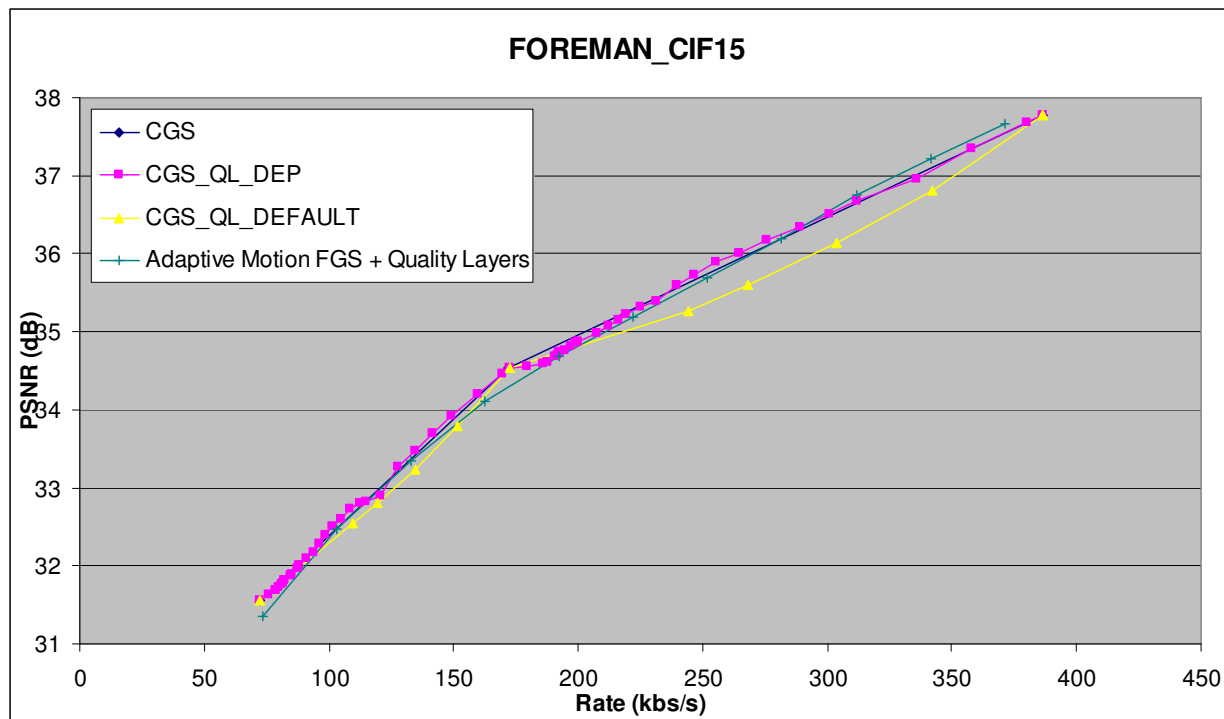
Brief review of JVT-S044

- Fine Grain Scalability (FGS) mode
 - Continuous set of extraction points
 - Progressive refinement
 - Truncation of NAL units to reach a target rate point
- Coarse Grain Scalability (CGS) mode
 - Discrete set of extraction points
 - Limited to the number of layers, D_ID
 - No truncation



Brief review of JVT-S044

- Allowing medium grain scalability using CGS bitstream
 - CGS NAL units coded as SNR refinements (with quality_level > 0)
 - Extension of quality layers to the CGS case
- Allows a higher number of extraction points



Syntax modification for JVT-S044

| | | |
|--------------------------------------|---|-------|
| if(slice_type != PR) { | | |
| if(redundant_pic_cnt_present_flag) | | |
| redundant_pic_cnt | 2 | ue(v) |
| if(slice_type == EB) | | |
| direct_spatial_mv_pred_flag | 2 | u(1) |
| <i>if(quality_level == 0)</i> | | |
| base_id_plus1 | 2 | ue(v) |
| if(base_id_plus1 != 0) { | | |
| Adaptive_prediction_flag | 2 | u(1) |
| } | | |

Signaling FGS NAL unit

- FGS NAL unit could no more be identified on high level syntax
 - because $Q > 0$ also possible for CGS
- Syntax modification proposed: 2 alternatives
 - Use of reserved_zero_bit of NAL headers
 - Indication in SPS
 - More compact signalling
 - But same type of NAL units for all sequence images

Signaling FGS NAL unit

■ Use of reserved_zero_bit

| nal_unit_header_svc_extension() { | C | Descriptor |
|---------------------------------------|-----|------------|
| simple_priority_id | All | u(6) |
| discardable_flag | All | u(1) |
| Reserved_zero_bit fgs_flag | All | u(1) |
| Temporal_level | All | u(3) |
| dependency_id | All | u(3) |
| quality_level | All | u(2) |
| nalUnitHeaderBytes += 2 | | |
| } | | |

Signaling FGS NAL unit

■ Indication in the SPS

| seq_parameter_set_svc_extension() { | C | Descriptor |
|--------------------------------------|---|------------|
| Extended_spatial_scalability | 0 | u(2) |
| ... | | |
| fgs_flag | | u(1) |
| if (fgs_flag) | | |
| fgs_coding_mode | 2 | u(1) |
| ... | | |

Recommendations

- Adopt the use of non PR slices for coding SNR enhancements (`Quality_level` > 0 in the NAL header)
- Suppress the `base_id_plus_one` from the slice header of CGS NAL unit having a non-zero `quality_level`.
- Adopt one of the alternatives proposed to signal NAL units that can be truncated.