Samsung R&D Institute Bangalore (SRIB) participation to JVET 30

Summary Report

21 April to 28 April 2023

SAMSUNG

Overview

- JVET 30 (AD) meeting was held from 21st April to 28th April 2023
- Meetings were held in Antalya, Turkiye
- This presentation covers the meetings attended by Samsung R&D Institute, Bangalore
  - SC29/WG 5: JVET (Neural network-based video coding, ECM, Video Coding For Machine, etc.)
- More discussion and notes can be found at
  - https://www.itu.int/wftp3/av-arch/jvet-site/2023_04_AD_Antalya/
  - https://dms.mpeg.expert/
  - http://phenix.int-evry.fr/jvet/

SC29/WG 5 : JVET

- AHG11 : Neural network-based video coding (JVET-AD2023)
  - Loop Filtering: Unified reference code and model finalization
    - BoG met 4 times to discuss and decide on the following aspects
      - “Low complexity” and “High gain” points were defined with unified table for data generation, training, inference and model arch.
      - Contributions towards improving the current methods with EE and non EE contributions were made (improved gains, complexity reductions, etc.)
      - Timelines decided for new reference software and anchor results generation defined
    - Contributions towards EE, non-EE and EE related were discussed
      - Combining best features of FilterSet#1 and FilterSet#2 : larger activation, large receptive field
      - Complexity reduction
      - Channel re-distribution for Luma and Chroma
      - Adjustment of residual, Flipping, QP fix in inference and other minor improvement were also discussed
  - NN Intra Coding
    - Complexity reduction of NN based intra model was proposed
  - NN Inter and NN based E2E coding
    - Complexity reduction of previously proposed Inter tool was proposed

SC29/WG 5 : JVET

- AHG12 : Enhanced compression beyond VVC capability
  - Contributions for enhanced compression capabilities through improvement in Intra prediction, SCC, Loop filter etc. were discussed
  - Emphasis on gain vs complexity trade-off discussed. Memory consumption identified as important.

- Exploration Experiments (EE1 & EE2) and related contributions were majorly discussed

- Joint meeting
  - Changes of CTC for VCM
  - Reliability of Metrics for VCM task was discussed
  - SEI for VCM and its viability was discussed

EE1-related and Non-EE1

	Category	Document	Title
EE	In-loop filter	JVET-AD0156	EE1-1.1: Complexity Reduction on Neural-Network Loop Filter
EE related	In-loop filter	JVET-AD0107	EE1-related: Simplified parameter selection for filter set #1
		JVET-AD0157	EE1-related: Neural-network loop filters in EE1-1.1.2 with further complexity reduction
		JVET-AD0167	EE1-1.7-related: Combination test for NNVC based on filter set 0
		JVET-AD0207	EE1-Related: Additional results for EE1-1.3.1 and EE1-1.3.5
		JVET-AD0211	EE1-Related: Combination test of EE1-1.3.5 and multi-scale component of EE1-1.6
		JVET-AD0237	EE1-related: Residue input for filter set #1
	Inter	JVET-AD0162	EE1-2.1-related: DRF Model without QP Input
	RPR	JVET-AD0170	EE1 related: Performance Improvement of AC0052 filter for RPR-based SR in RA configuration
Non-EE	In-loop filter	JVET-AD0050	AHG11/AHG14: Fix input QP for NN filter set #1
		JVET-AD0109	AHG11: Neural network loop filter
	Intra	JVET-AD0212	AhG11 : neural network-based intra prediction with reduced complexity
	Post filter	JVET-AD0163	AHG11: Updating NNPFC and NNPFA SEI messages for the NNPF
	S/W	JVET-AD0111	AhG14: Guidelines for NNVC reference software development
		JVET-AD0164	AhG14: SADL v5 changes
		JVET-AD0365	AHG14: The extension of SADL library

NNVC BOG

- **Unified NN-Loop filter**
  - Low operation point
    - JVET-AD0156 (16kMac/pxl)
    - Enable in default configuration of NNVC-5.0
  - High operation point (HOP)
    - Decided by several rounds of discussion. Refer BoG Report
  - Criteria for adoption to NNVC SW: training from the scratch scripts, cross-checked both test and training (both inference and RDO models), models in SADL int16 (for inference model).

  - Filter design and filter training
    - See attachment