MPEG 3DTV FTV EE on the Lovebird1 Data Set
&
Multiresolution View Interpolation

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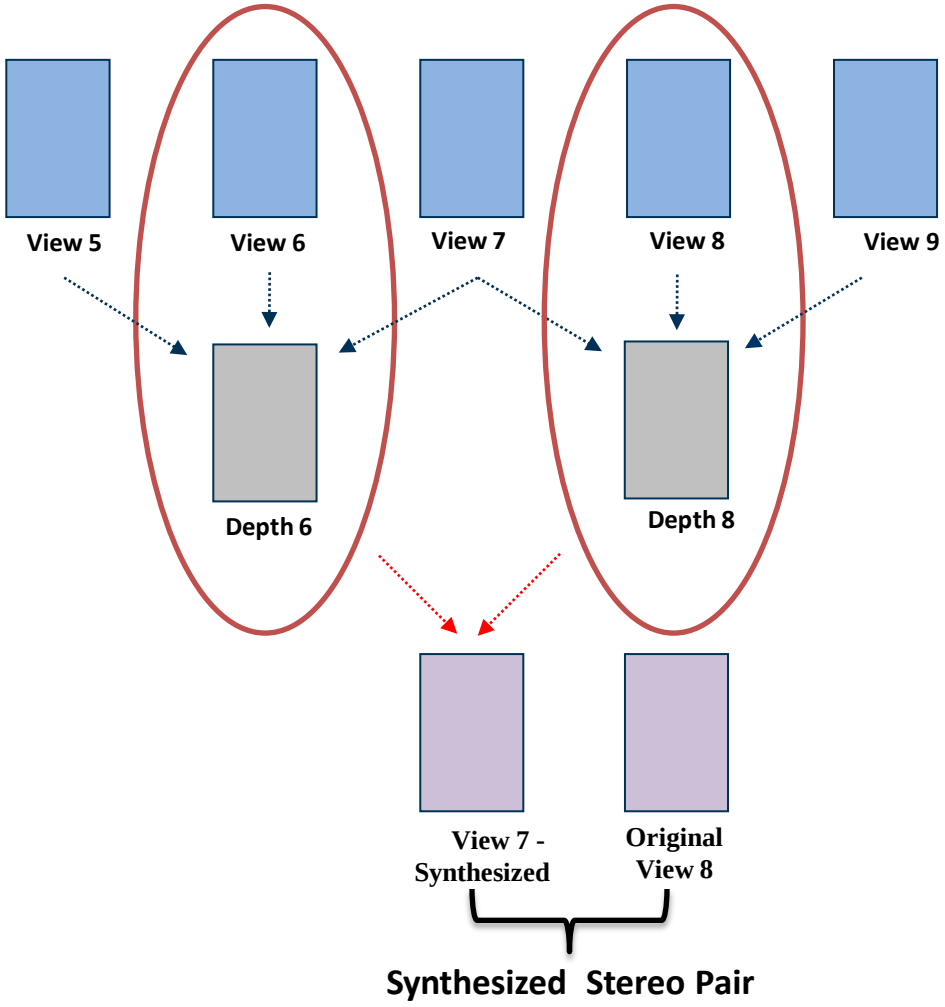
Outline

- FTV Exploration Experiments(EE)
- EE1: Depth Estimation
- EE4: Coding Experiment
- Multiresolution View Interpolation

FTV Exploration Experiments

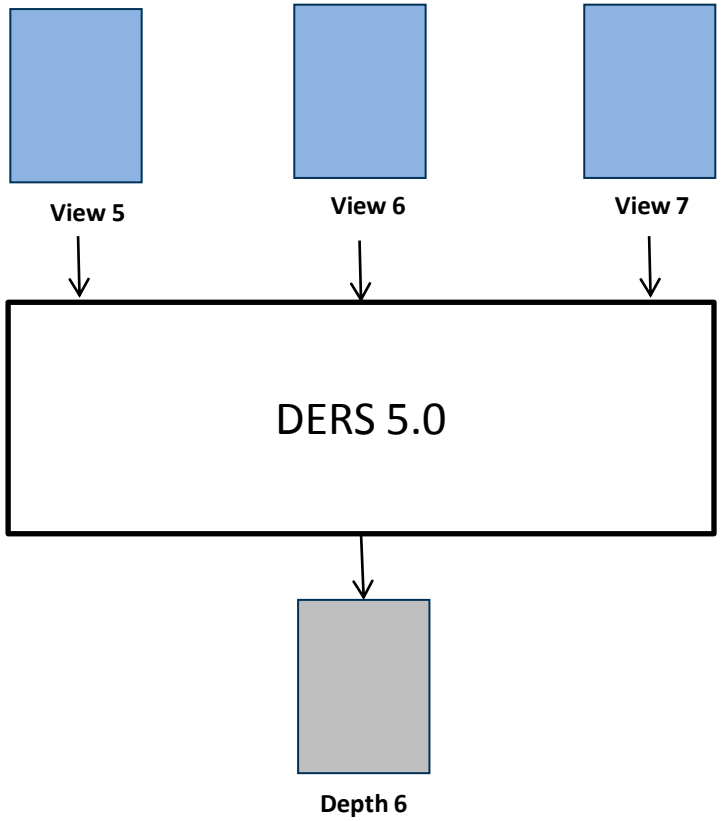
- EE1
  - Experiment for the depth map generation improvement with DERS 5.0 and the synthesized views quality improvement with VSRS 3.5.
- EE4
  - Coding experiments for the texture views and the depth map using the JMVC 5.0.5 reference software.
  - The goal of experiment is to get insights on how the depth maps coding affects the quality of synthesized views.

Exploration Experimental 1 Set Up

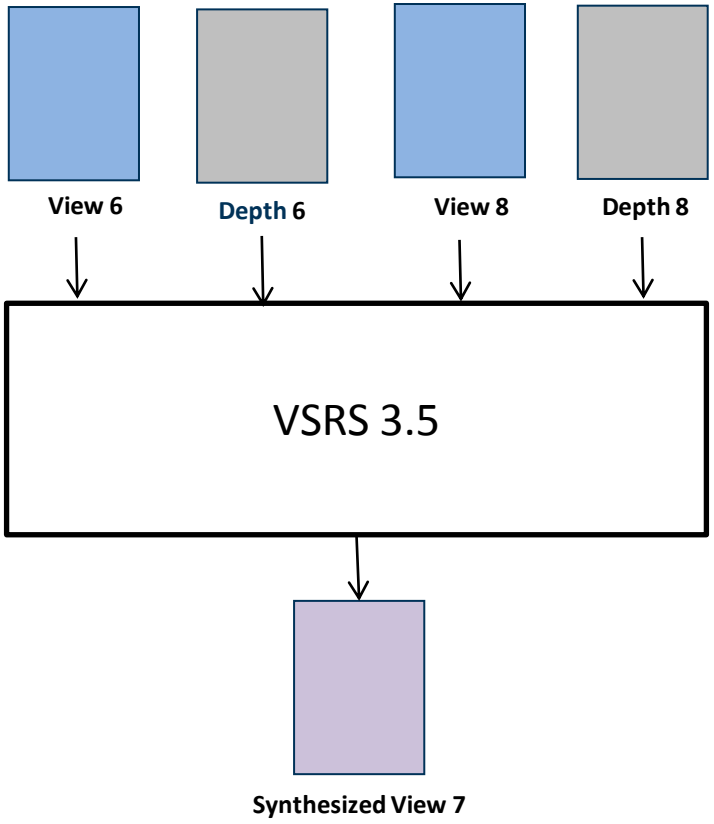


Reference Software

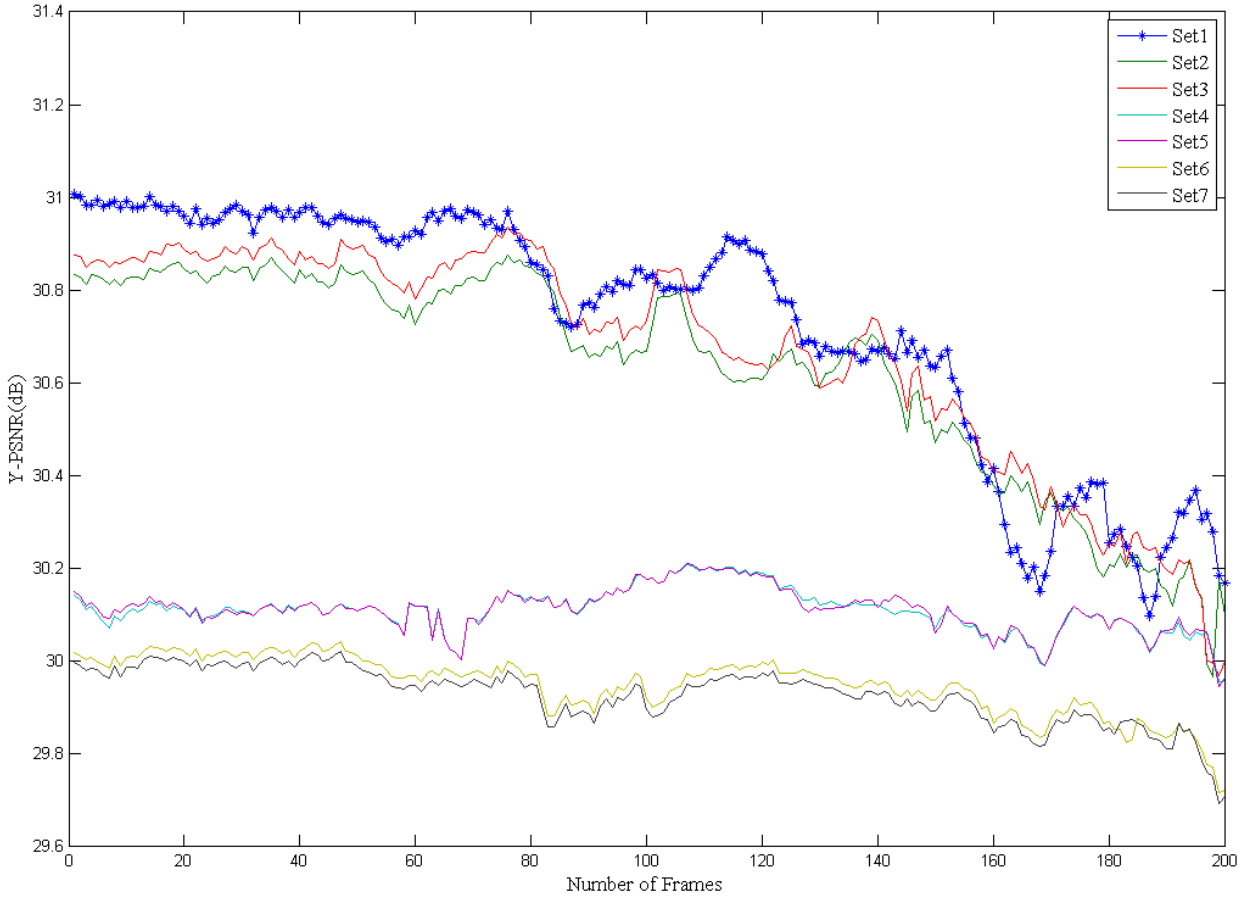
Depth Estimation Reference Software (Version 5.0)



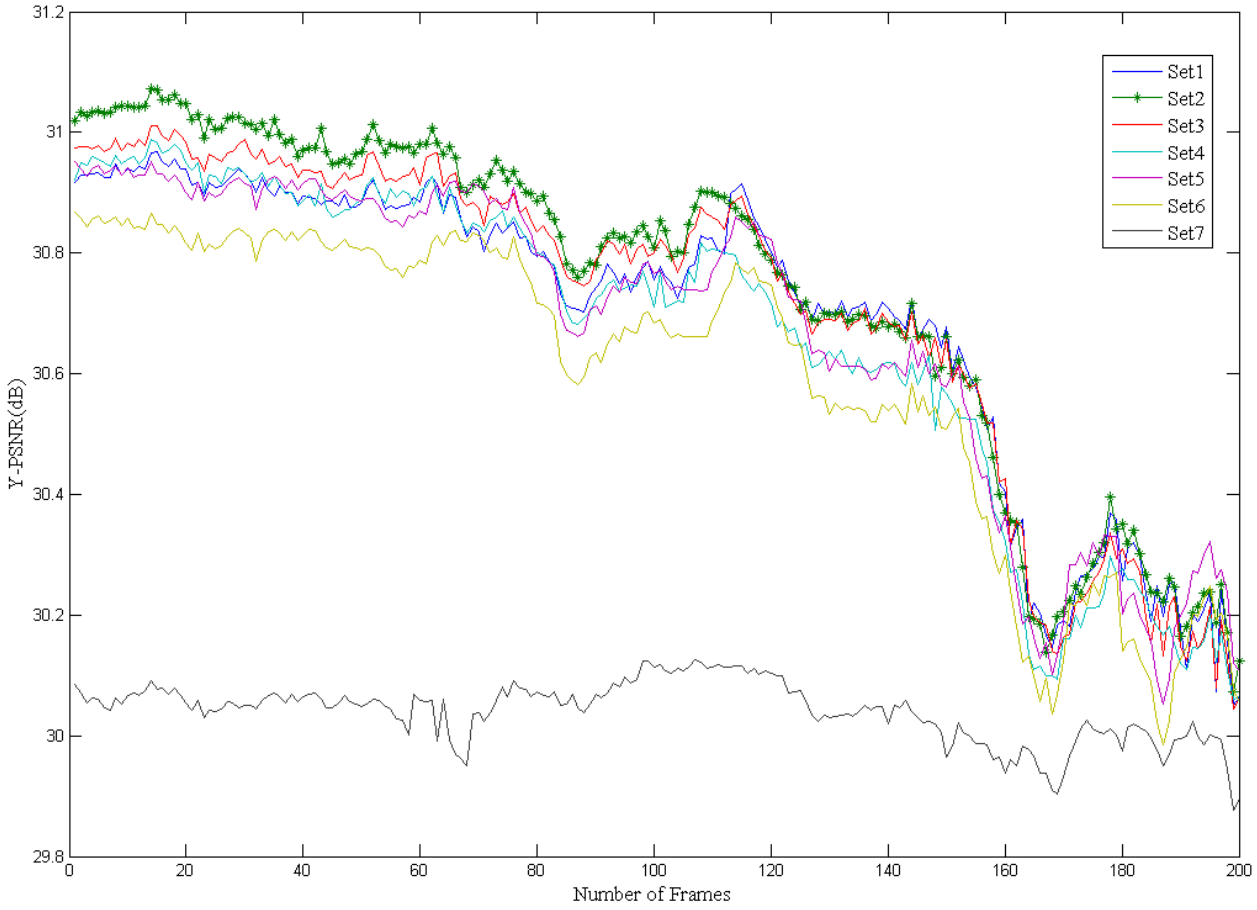
View Synthesis Reference Software (Version 3.5)



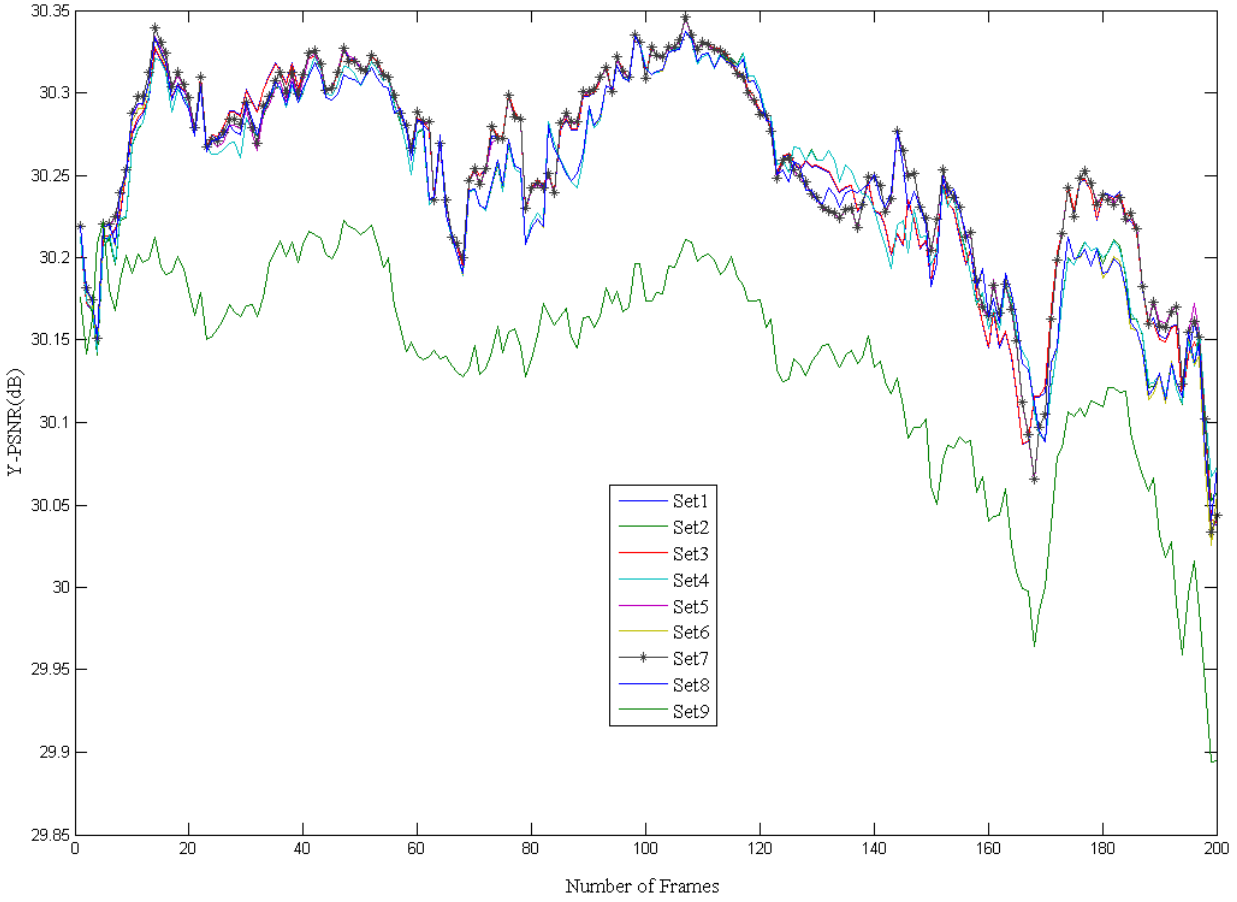
Automatic Depth Estimation Mode



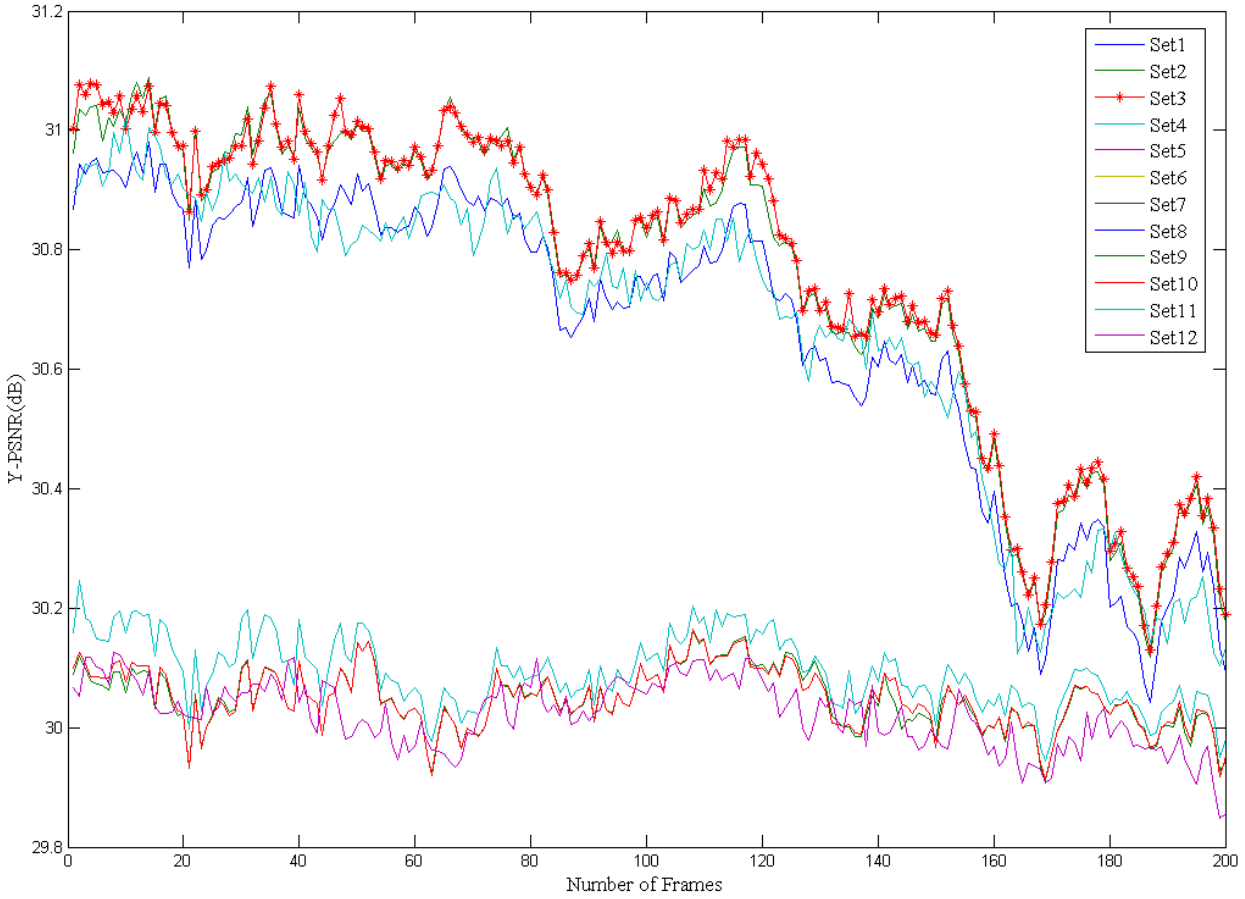
Semi-automatic Depth Estimation Mode 1



Semi-automatic Depth Estimation Mode 2



Reference Depth Estimation Mode



EE1 Summary

Depth Estimation Mode	Average Y-PSNR (dB)
Automatic Mode	30.73070
Semi-automatic Mode 1	30.74090
Semi-automatic Mode 2	30.25470
Reference Depth Mode	30.76841

Estimated Depth Maps

(Estimated depth maps obtained by DERS 5.0 using depth estimation mode “3”)

(a) Frame #01

(d)Frame #100

(C) Frame #150

(d)Frame #200

Synthesized Views

(Synthesized “lovebird1” view 7 using VSRS 3.5)

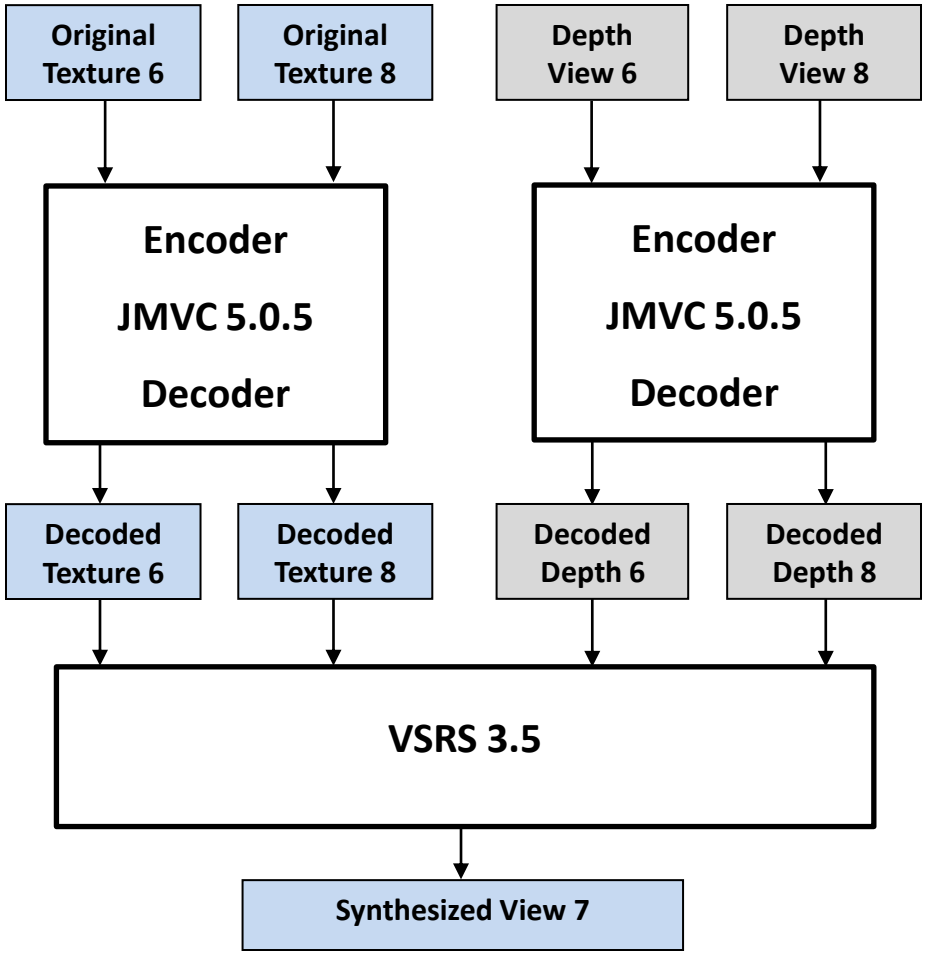
(a) Frame #01

(d)Frame #100

(C) Frame #150

(d)Frame #200

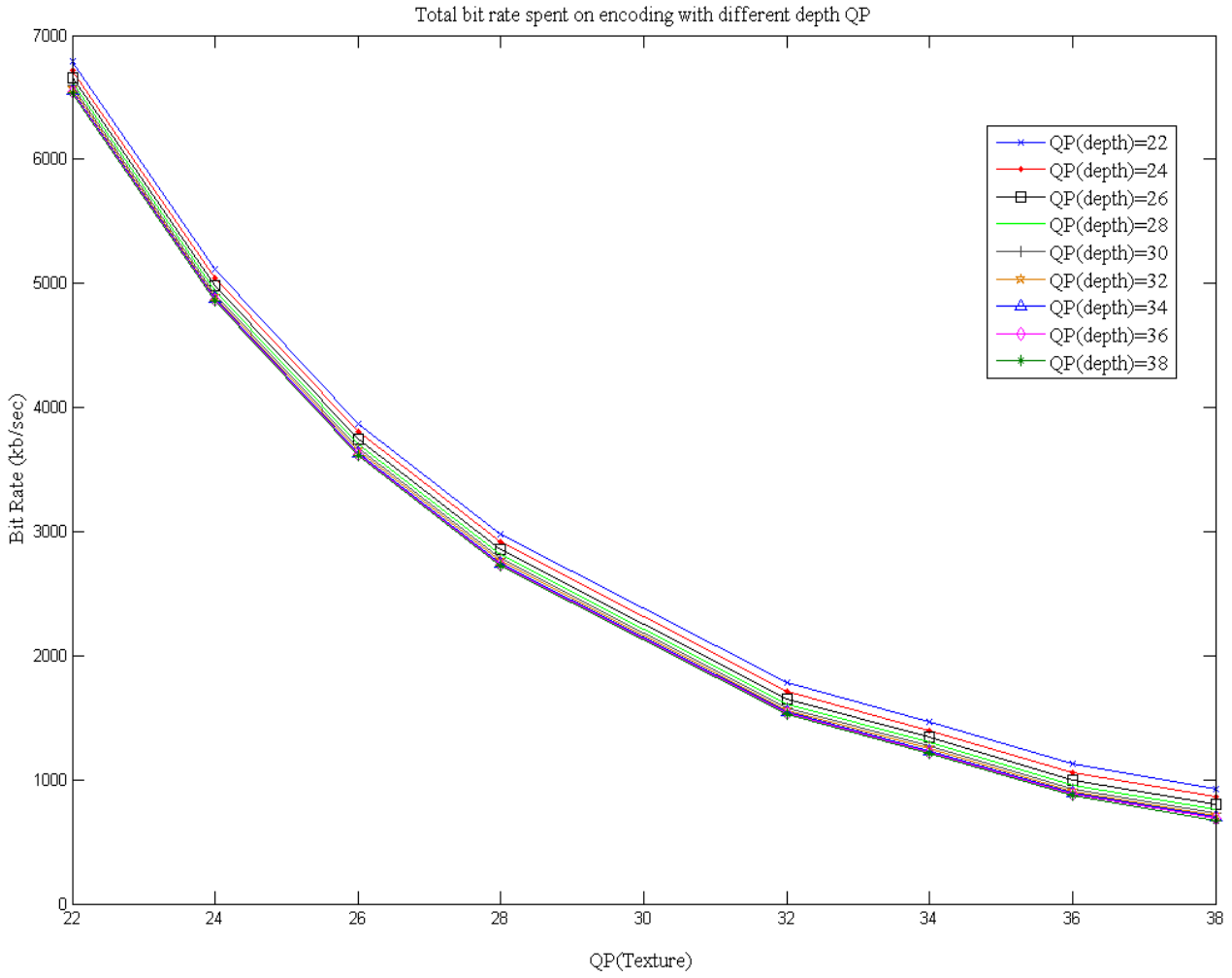
Exploration Experimental 4 Set Up



Coding Parameters

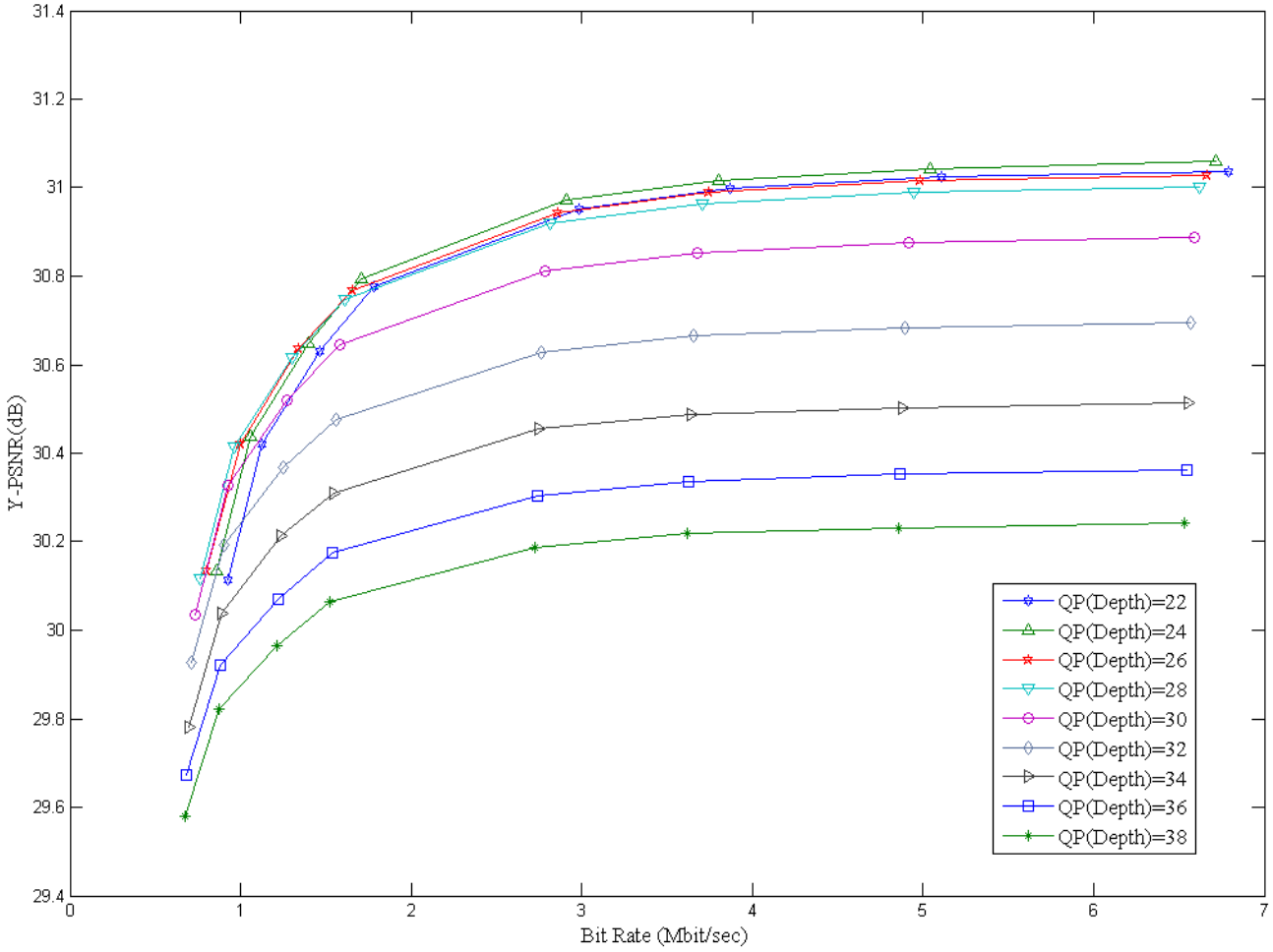
JMVC 5.0.5 Coding Parameter	
Quantization Parameter (Texture)	{22, 24, 26, 28, 32, 34, 36, 38}
Quantization Parameter (Depth)	{22, 24, 26, 28 , 30 , 32, 34, 36, 38}
Frames To Be Encoded	200
GOP Size	8
Intra Period	8
Inter Period Pics First	1
Search Mode	Fast Search
Search Range	96
View Scalability Information SEI	ON
View Order	0-2

EE4 Results



Total bit rate spent on encoding texture with different depth QP for views (6, 8)

EE4 Results



Quality of the synthesized view 7 vs. the total bit rate.
(when QP for depth map is fixed and QP for texture varies)

Synthesized Views

(Synthesized “lovebird1” view 7 using “decoded texture” and “decoded depth map”)

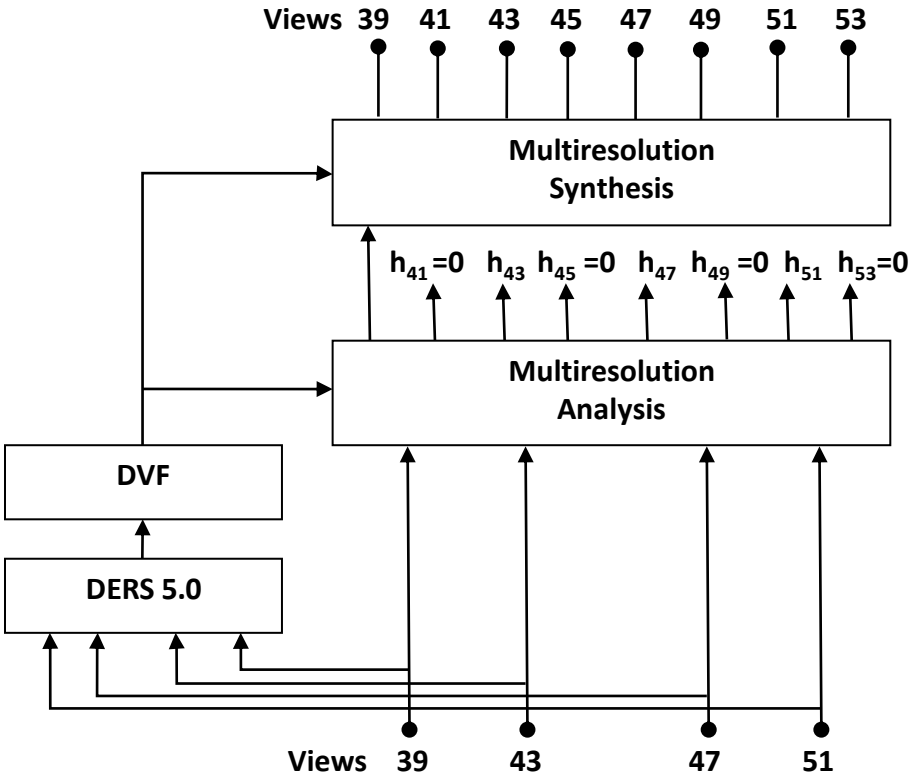
(a) Frame #01

(d)Frame #100

(C) Frame #150

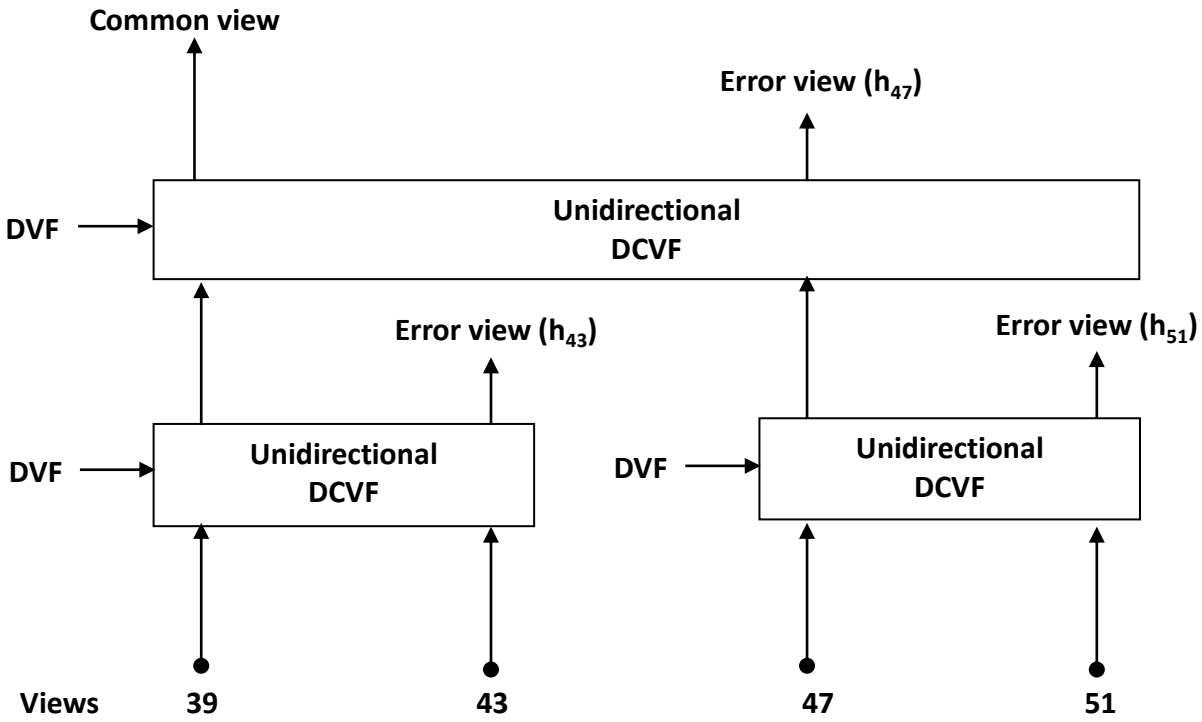
(d)Frame #200

View Interpolation *via* Multiresolution View Analysis and Synthesis

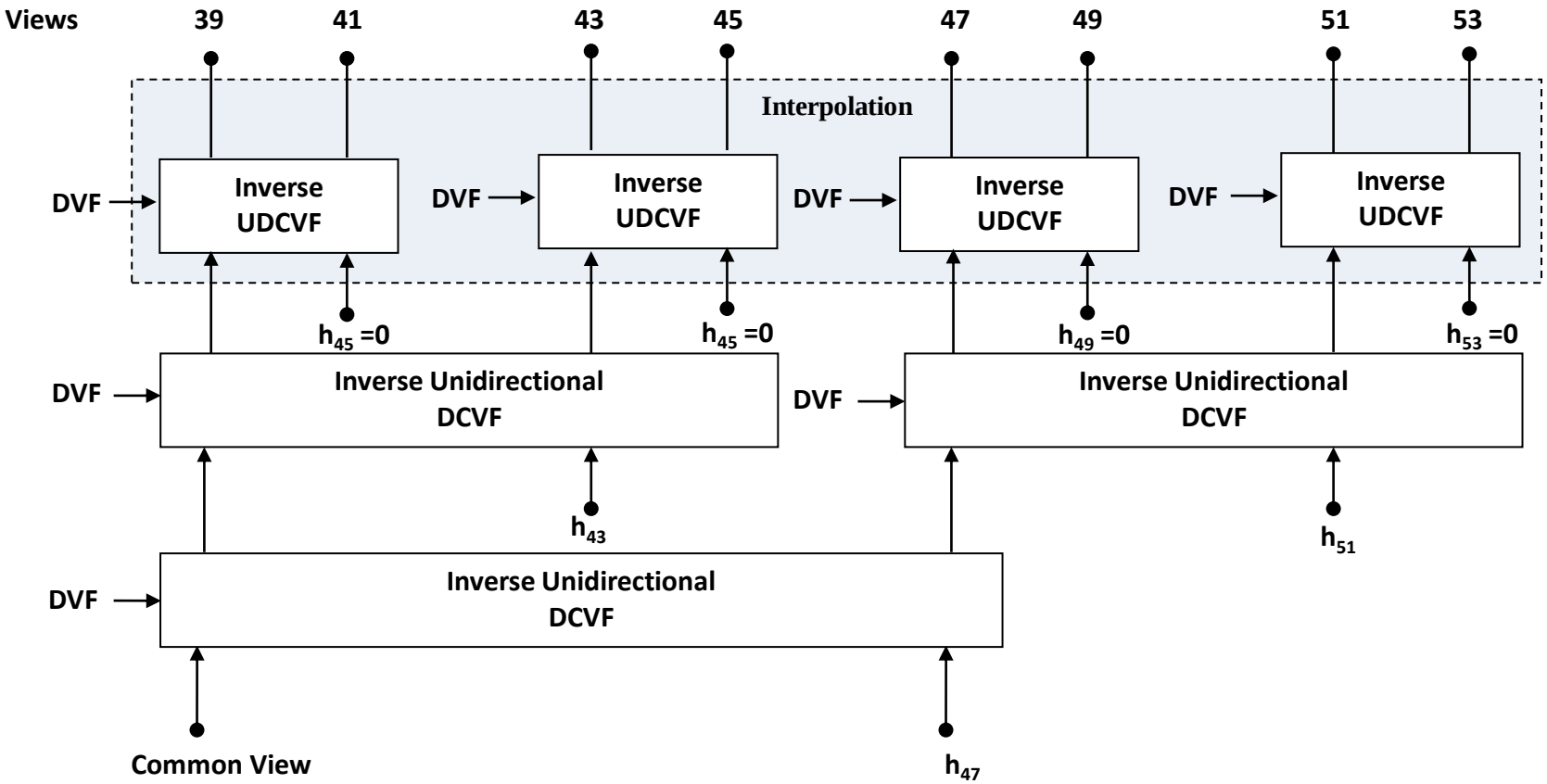


Multiresolution View Analysis and Synthesis

Multiresolution View Analysis



Multiresolution View Interpolation



View Interpolation Results

Pantomime Views 39

Pantomime Views 41

Pantomime Views 43

Pantomime Views 45

Pantomime Views 47

Pantomime Views 49

Pantomime Views 51

Pantomime Views 53

Conclusions

- EE1
  - Depth estimation by using a "*reference depth map*" (depth estimation mode "3") improves the quality of estimated depth map and hence the quality of the view synthesis.
- EE4
  - Quality of the synthesized view improves by assigning more bit rate to texture views.
- Multiresolution View Interpolation
  - Investigating consistent DVF representations for the multi-resolution view interpolation by using the MPEG reference software

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