



MEDIATEK

JVET-N0097

CE9-related: Simplification of cascading DMVR and BDOF processes

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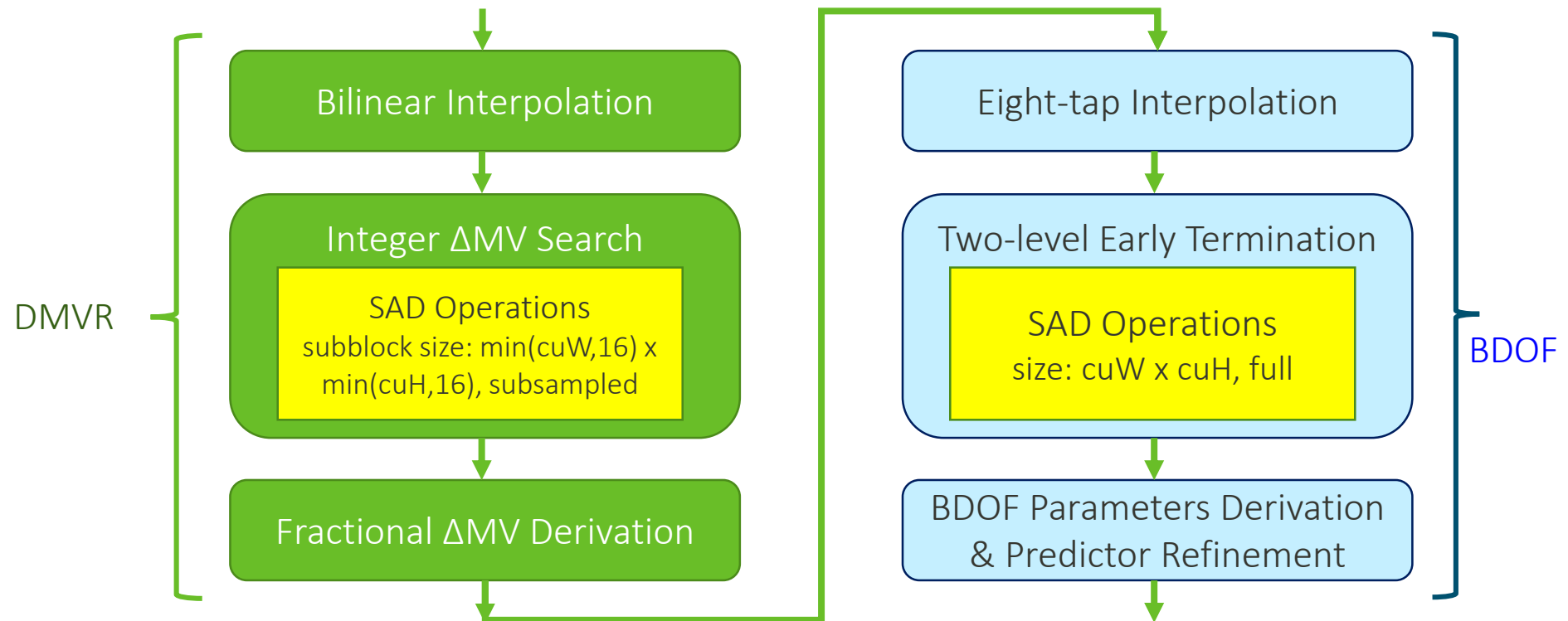
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Overall Summary

- Proposed two modifications to relieve the critical path of inter prediction, DMVR + BDOF
 - Use the SAD calculated in DMVR to do early termination in BDOF
 - Unify the SAD operations in DMVR and BDOF early termination, including the processing unit and the cost function
- Reduce the critical path and easily to share the SAD accelerator for DMVR and BDOF
- Experimental result
 - The BD-rates are -0.01%, 0.00%, 0.00% for Y, Cb, and Cr components, respectively

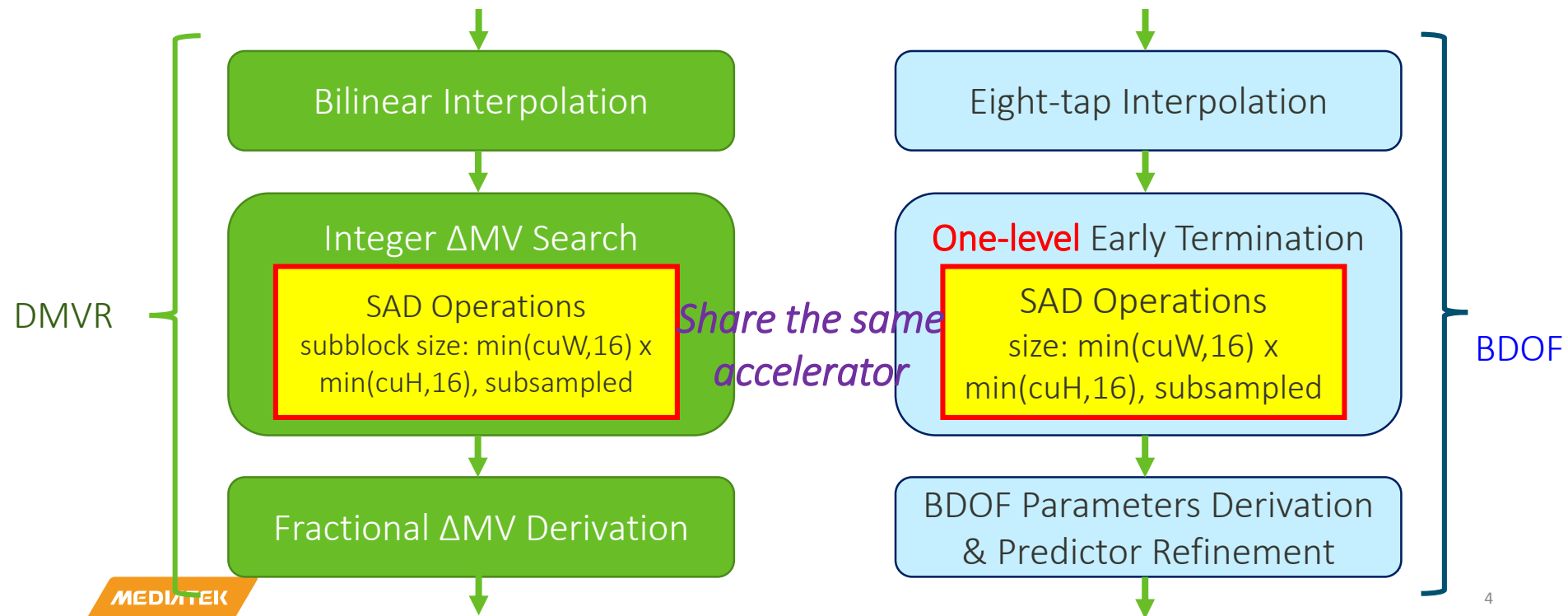
DMVR + BDOF

- The critical path of inter prediction



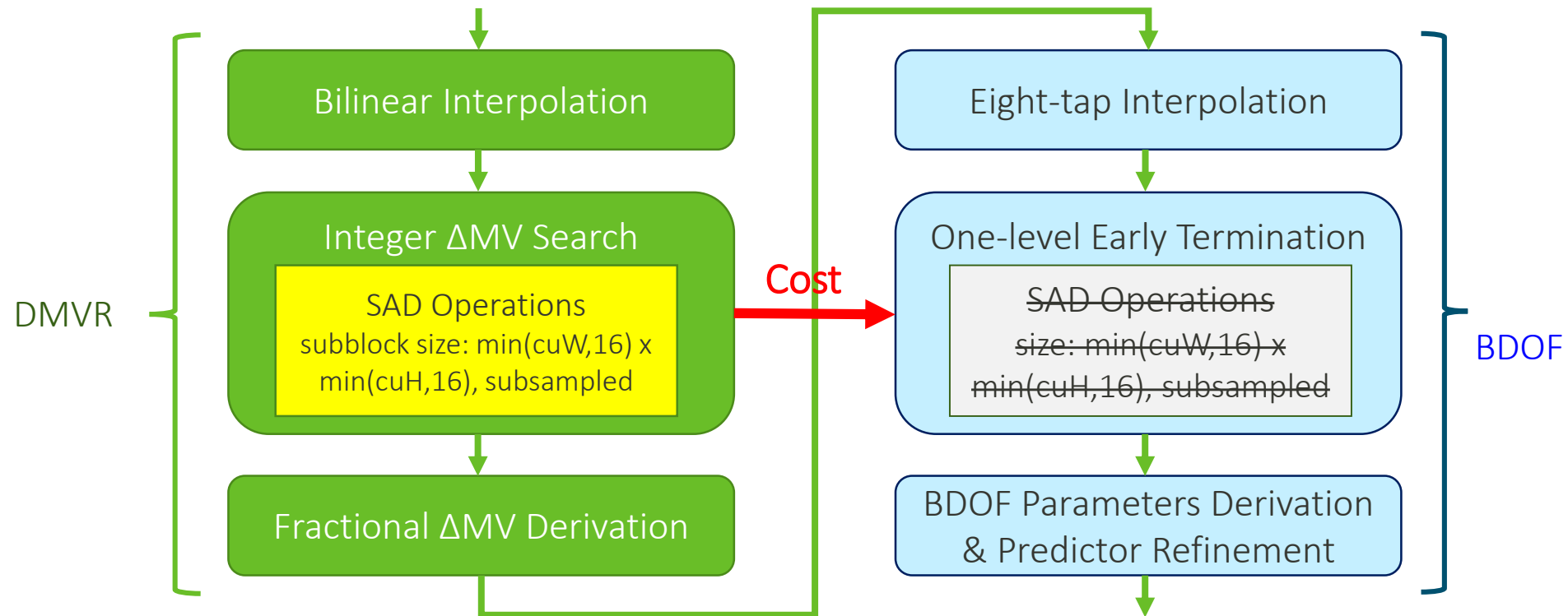
Proposed Modifications (1/2)

- Unify the processing unit of DMVR and BDOF early termination
- Use the same cost function of SAD



Proposed Modifications (2/2)

- Use the SAD calculated in DMVR to do early termination in BDOF



Simulation Results

- Implemented on top of VTM-4.0

	RA				
	Y	U	V	EncT	DecT
Class A1	-0.01%	0.00%	0.02%	101%	102%
Class A2	-0.03%	0.01%	0.05%	100%	101%
Class B	0.00%	0.00%	0.00%	100%	101%
Class C	0.00%	-0.01%	-0.06%	100%	100%
Class E					
Overall	-0.01%	0.00%	0.00%	100%	101%
Class D	-0.01%	-0.03%	-0.09%	101%	100%
Class F	-0.02%	-0.01%	-0.02%	101%	99%

Conclusion

- Reduce the critical path of inter prediction (DMVR+BDOF) and easily share the SAD accelerator for DMVR and BDOF
 - Use the SAD calculated in DMVR to do BDOF early termination
 - Unify the SAD operations in DMVR and BDOF early termination, including the processing unit and cost function of SAD
- Experimental results show that the BD-rate and run time changes are negligible
- Thanks Kwai for cross-checking

