CCITT SGXV
Working Party XV/1
Experts Group for ATM Video Coding

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SOURCE : Japan
TITLE : Picture quality comparison of format conversion through / not through SCIF
PURPOSE : Information

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1. Introduction

When we evaluate the picture quality of inter-regional format conversion (525 system ↔ 625 system) through SCIF, we should compare the degradation with that of other methods such as a direct conversion (AVC-256R ANNEX 3). By D1 tape demonstration both conversions are compared on several test sequences.

2. Picture format conversion algorithms

Test sequences with the format of 720 x 576 x 50, 2:1 and 720 x 480 x 60, 2:1 are converted into each other by the following algorithms.

(i) 625 system → 525 system
(Conversion A)
720 x 576 x 50, 2:1 --(Filter 1)--> 720 x 576 x 60, 1:1 (SCIF) --(Filter 2)--> 720 x 480 x 60, 2:1
(Conversion B)
720 x 576 x 50, 2:1 --(Filter 3)--> 720 x 576 x 50, 1:1 --(Filter 4)-->720 x 576 x 60, 1:1 (SCIF) --(Filter 5)--> 720 x 480 x 60, 1:1--(Decimation)-->720 x 480 x 60, 2:1
(Conversion C)
720 x 576 x 50, 2:1 --(Filter 6)--> 720 x 480 x 60, 2:1

(ii) 525 system → 625 system
(Conversion D)
720 x 480 x 60, 2:1 --(Filter 1)--> 720 x 576 x 60, 1:1 (SCIF) --(Filter 2)--> 720 x 576 x 50, 2:1
(Conversion E)
720 x 480 x 60, 2:1 --(Filter 3)--> 720 x 480 x 60, 1:1 --(Filter 4)-->720 x 576 x 60, 1:1 (SCIF) --(Filter 5)--> 720 x 576 x 50, 1:1--(Decimation)-->720 x 576 x 50, 2:1
(Conversion F)
720 x 480 x 60, 2:1 --(Filter 7)--> 720 x 576 x 50, 2:1

Filter 1: 2 or 3 tap-filter referring to 2 fields (AVC-213)
Filter 2: 3 or 4 tap-filter referring to 1 frame (AVC-213)
Filter 3: 16 tap-filter referring to 1 field (AVC-239)
Filter 4: 5 → 6 conversion filter referring to 9 fields (AVC-80 ANNEX 2)
Filter 5: 6 → 5 conversion filter referring to 11 fields (AVC-80 ANNEX 2)
Filter 6: 2 or 3 tap-filter referring to 2 fields (ANNEX)
Filter 7: 2 or 3 tap-filter referring to 2 fields (ANNEX)

In the D1 tape demonstration picture quality is compared by using several test sequences in the following way.

Table 1 Comparison of picture format conversion

625 system → 525 system			525 system → 625 system		
Sequence	Left	Right	Sequence	Left	Right
Moving Circular Zone Plate (MCZP)	C C	A B	MCZP	F F	D E
Regular Icosahedron (RIH)	C C	A B	RIH	F F	D E
Car	C C	A B	Mobile & Calendar	F F	D E

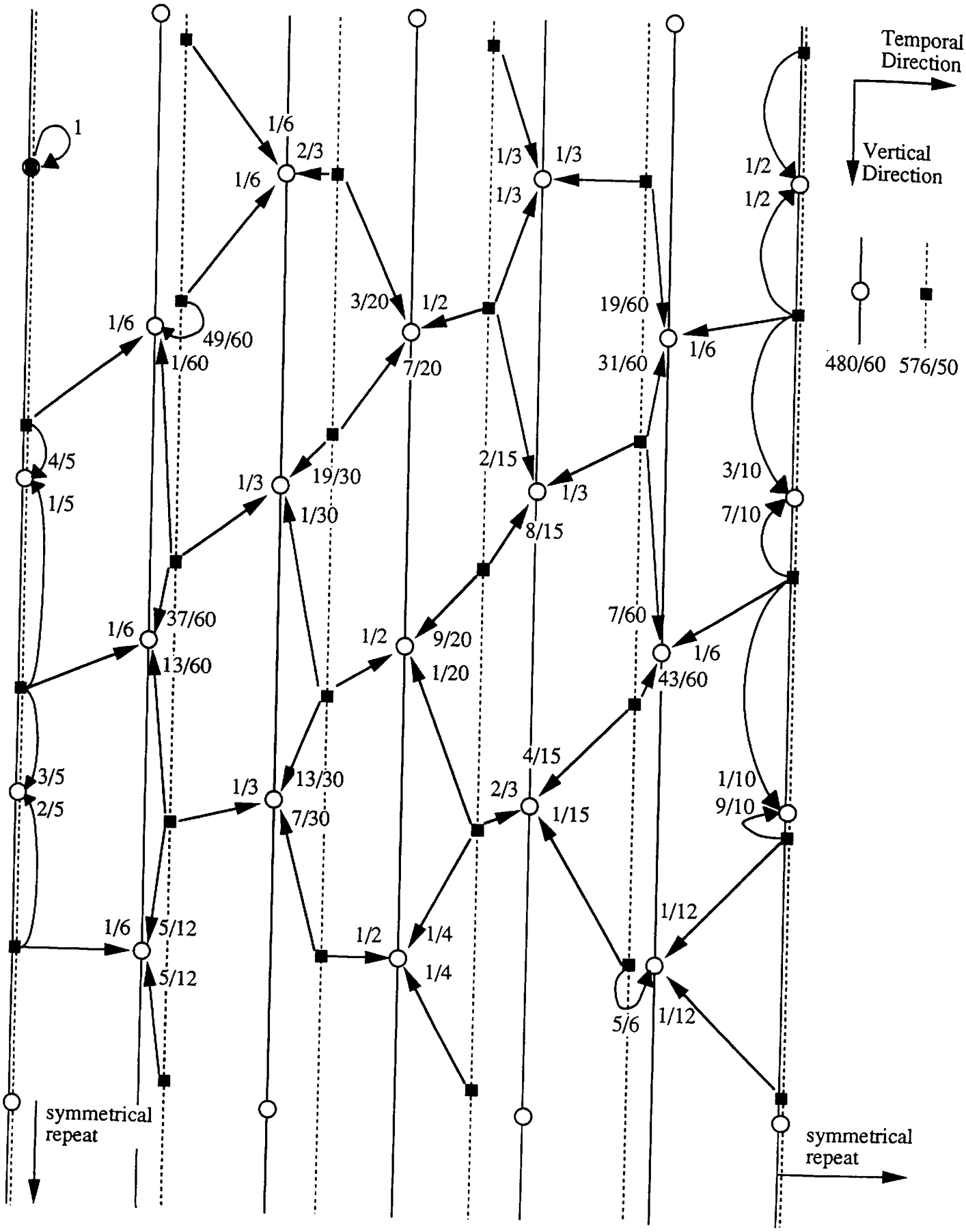
3. Conclusion

Conversion B and E keep edges crispy although they cause large conversion delay. Conversion A, D, C and F are simple with little conversion delay and provide similar picture quality except that conversion A and D make some jerkiness along slant lines because Filter 2 refers to only 1 frame.

In the last we should note that direct conversion is only an example of an approach not using SCIF for transmission format. Further investigation of the approach may be required.

End.

Filter 6 : 576/50 → 480/60



Filter 7 : 480/60 → 576/50