Video Codecs Comparison

Part 4: Visual Comparison

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Preparing: Nikolai Trunichkin

9 testing sequences!
11 days (260 hours) total compression time!
33 tested codecs!
2430 resulting sequences!

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Video Group
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Video Codecs Comparison
Part 4: Visual Comparison
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**Bbc3di 1494 kbps – frame 64**

Divx 3.1 fm, Divx 4.02, Divx 5.02, Xvid 2.1, Microsoft v3

<table>
<thead>
<tr>
<th>Original</th>
<th>Divx 3.1 fm(+9%)</th>
<th>Divx 4.02(+7%)</th>
<th>Divx 5.02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picture 1</td>
<td>Picture 2</td>
<td>Picture 3</td>
<td>Picture 4</td>
</tr>
<tr>
<td>Xvid 2.1(+2%)</td>
<td>Microsoft v3 (+5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picture 5</td>
<td>Picture 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusions:

- Quality of the frame after Xvid 2.1 is noticeably worse than the others.
- Quality of the frame after Divx 4.02 is also not very good; especially well it is seen on the fragment with the locomotive.
- Superiority of Microsoft v3 and Divx 3.1 fm is well seen on the fragment with the “Ea” letters (above them), but at the same time these codecs exceed the bitrate while Divx 5.02 does not do it.
Battle 1225 kbps – frame 135

3IVX D4, Divx 3.1 fm, Divx 3.1 lm, Divx 4.02, Divx 5.02

Picture 12. Original

Picture 13. 3IVX D4 (+1%)

Picture 14. Divx 3.1 fm

Picture 15. Divx 3.1 lm (+2%)

Picture 16. Divx 4.02 (+4%)

Picture 17. Divx 5.02 (+3%)
Conclusions:

- It's easy to see that the frame after Divx 3.1 has the best quality. Its superiority is well seen on the fragment with the weapon barrel.
- Divx 3.1 fm works best in the corners.
Battle 743 kbps – frame 135

VSS H.264, Microsoft v3, Xvid 2.1, Divx 3.1 fm, Divx 5.02

Picture 23. Original
Picture 24. VSS H.264
Picture 25. Microsoft v3 (+3%)
Picture 26. Xvid 2.1
Picture 27. Divx 3.1 fm (+3%)
Picture 28. Divx 5.02 (+9%)
Battle 941 kbps – frame 135

MM JPEG2000, MM JPEG v2, Microsoft v3, Divx 3.1 fm, Visicron J
Conclusions:

- Loss of quality after almost all JPEG codecs can be seen by sight.
- Quality of the frames after Divx 3.1 fm and Microsoft v3 is almost the same; however there is some difference in the upper and bottom left corners.
Tensdi 2576 kbps – frame 205

Divx 3.1 fm, Divx 3.1 lm, Divx 4.02, Divx 5.02, 3IVX D4

Picture 45. Original

Picture 46. Divx 3.1 fm (+10%)

Picture 47. Divx 3.1 lm (+10%)

Picture 48. Divx 4.02

Picture 49. Divx 5.02

Picture 50. 3IVX D4 (+15%)
Conclusions:

- Loss of quality after 3IVX D4 is well seen: there are increases of brightness and smoothness in the background.

- Quality of this frame after other codecs is approximately the same; there is just a small difference above the racket and to the left of it.
Tensdi 1264 kbps – frame 205

Microsoft v3, MMJPEG2000, MMJPEG v2, Xvid 2.1, Visicron J-mode

Picture 56. Original
Picture 57. MM JPEG2000 (+7%)
Picture 58. JPEG v2 (+138%)
Picture 59. Microsoft v3 (+6%)
Picture 60. Xvid 2.1
Picture 61. Visicron J-mode (+8%)
Conclusions:

- Visicron J has some superiority among the other JPEG codecs.
- Microsoft v3 and Xvid 2.1 keep the quality almost in the same way.
Bankomatdi 1430 kbps – frame 239

Ligos 4.5, Ligos 5.11, VP 3.1, Motion Wavelets, VSS 1.2

Picture 67. Original

Picture 68. Ligos 4.5 (+9%)

Picture 69. Ligos 5.11 (+8%)

Picture 70. VP 3.1 (+5%)

Picture 71. Motion Wavelets (+5%)

Picture 72. VSS 1.2
Conclusions:

- Turning of the head represents motion in this frame, that’s why there is some loss of quality on the left part of the face.

- It’s easy to see that VP3.1 and VSS1.2 have the least losses of quality but VP3.1 has a higher bitrate.
Bus 578 kbps – frame 81

Ligos 4.5, Ligos 5.11, VP 3.1, Motion Wavelets, VSS 1.2

Picture 78. Original
Picture 79. Ligos 4.5 (+9%)
Picture 80. Ligos 5.11 (+8%)
Picture 81. VP 3.1 (+12%)
Picture 82. Motion Wavelets (+6%)
Picture 83. VSS 1.2
This frame is good for codecs' visual comparison. Conclusions:

- Motion Wavelets and Ligos 4.5 have big losses of the background; the trees almost turn into one spot.
- Frame after Ligos 5.11 has the Gibbs effect.
- Quality of VP 3.1 and VSS 1.2 is rather good.
Nddp7di 1731 kbps – frame 32

Ligos 4.5, Ligos 5.11, VP 3.1, 3IVX D4, VSS 1.2

Picture 89. Original

Picture 90. Ligos 4.5 (+9%)

Picture 91. Ligos 5.11 (+7%)

Picture 92. VP 3.1

Picture 93. 3IVX D4 (+1%)

Picture 94. VSS 1.2 (+5%)
Conclusions:

- Frames after Ligos 4.5 and 3IVX D4 have the clearly seen block effect.
- Frame after Ligos 5.11 has the Gibbs effect.
- The difference between VSS 1.2 and VP 3.1 is well seen in the bottom left and upper right corners.
Foreman 534 kbps – frame 128

Ligos 3.2, Ligos 4.5, Ligos 5.11, Intel I.263, VSS 1.2

Picture 100. Original
Picture 101. Ligos 3.2
Picture 102. Ligos 4.5 (+11%)
Picture 103. Ligos 5.11 (+10%)
Picture 104. Intel I.263 (+4%)
Picture 105. VSS 1.2 (+6%)
Conclusions:

- Despite the fact that the frame after Intel I.263 has a worse metric than the frame after Ligos 3.2, the former one is better by sight, because the latter greatly changes colors.

- Frame after Ligos 4.5 has the block and the Gibbs effects. To a lesser degree this also can be said concerning Ligos 5.11.

- Frame after VSS 1.2 is the best one considering both metric and visual impression.
Bus 194 kbps – frame 81

Visicron J, Intel I.263, Ligos 4.5, Ligos 5.11, VSS 1.2
Conclusions:

- This frame is a drop frame for all the codecs except for VSS 1.2 and Visicron J. This explains the big difference in PSNR.
- Frames after VSS 1.2 and Visicron J show big losses of quality, which usually happens on low bitrate.
Outline

Video Codecs Comparison consists of the following sections:

- Part 1: Methodology
- Part 2: PSNR Diagrams For All Video Codecs
- Part 3: Frame-accurate Comparison
- Part 4: Visual Comparison – this document

NOTE: These files contain only a VERY SMALL PART of the processed and measured data.

If you find an error in this document, please write to video@graphics.cs.msu.su

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