



Image Processing and Pattern Recognition - KU - SES.303UF - WS 2025
Institute of Computer Graphics and Vision (ICG)
Graz University of Technology

Image Processing and Pattern Recognition

WS 2024

Assignment 0 – Interpolation and Error Measures

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1 Report

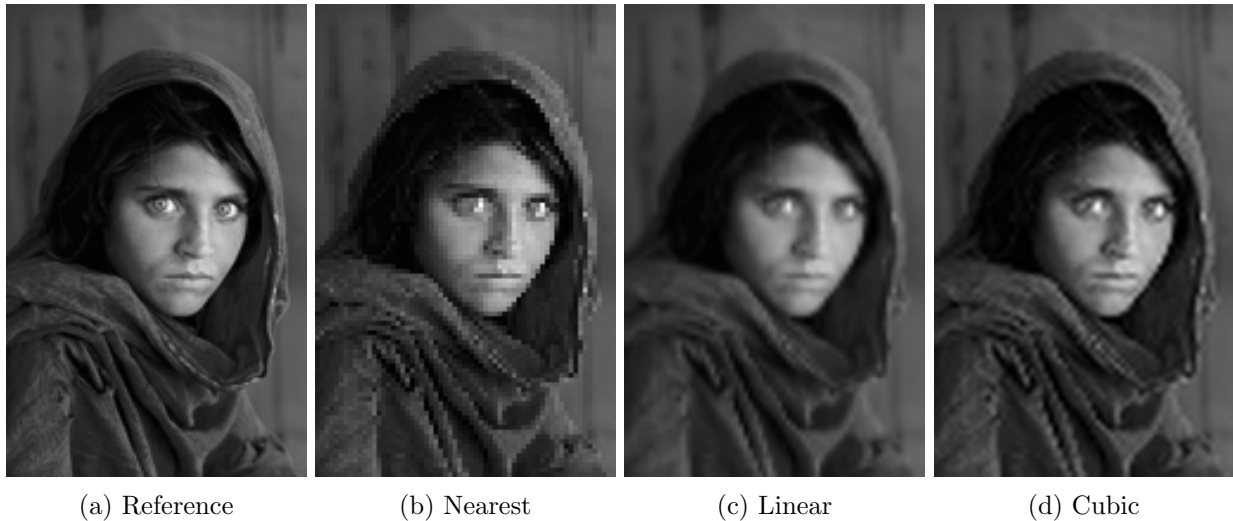


Figure 1: Comparison of MSSIM and PSNR of a nearest, linear and cubic approach.

Table 1: Comparison of MSSIM, PSNR without for loop, and PSNR for loop values for different interpolation methods.

Method	MSSIM	PSNR	PSNR_for
Nearest	0.803 174	27.167 299	27.167 299
Linear	0.889 006	31.092 117	31.092 117
Cubic	0.913 915	31.976 227	31.976 227

1.1 For vs no for loop

It can be seen in the Table 1 that the first few numbers after the coma are the same. In the longer solution there is only a difference in the 12th or 14th number after the coma for this example image. This would suggest that it is good enough to use the approach which is faster to run to, to still get a good result.

1.2 Nearest vs Linear vs Cubic

The MSSIM value suggests that the Cubic calculation is the closest to the reference for a human, with 0,9139 for this example. The image looks a little bit like if it was been compressed a little bit to much for a Webpage. The Nearest solution with the worst MSSIM looks pixilated. And the Linear approach with a MSSIM value between Nearest and Cubic looks blurred.

It can be observed that the Cubic solution has the highest PSNR and Nearest has the lowest PSNR value. The Linear and Cubic solution have a PSNR that is not so far apart from each other but the MSSIM helps to categories which of the images is closer to the reference for a human perception. For this example that would suggest that the Cubic solution is the closest to the original from a human perspective as well as for pixel-wise error measure.