

Image resampling with approximations by CCC–Schoenberg operators and contour stencils

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Resampling of digital images is an essential part of image processing. The most efficient and sufficiently accurate image resampling techniques can produce ringing artifacts, due the oscillations of the approximations near sharp transitions of color when upsampling. Also, the methods, based on the tensor products of one dimensional methods, can produce stairlike lines (aliasing). To solve the first problem, we use shape preserving approximations by CCC–Schoenberg operators [1] for the interpolation or histoploation process [2], applied dimension by dimension. The associated spline space is the space of variable degree polynomial splines. For the second one, we apply the contour stencils [3] to approximate locally along the image edges. A special approximation, based on tensor product, is designed for each stencil. The local approximations are calculated relatively simply, and than blended together to get the final approximation.

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References

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